AMERICAN ARTISAN

AUGUST
1941

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1880

The LAMNECK CREED

RECOGNIZING OUR FULL SHARE OF RESPONSIBILITY IN THE EXISTING NATIONAL EMERGENCY, THIS SHALL BE THE LAMNECK CREED:

To design, produce and supply products which will conserve every possible pound of metal and every possible hour of labor; and which likewise will conserve these vital resources—metal and man hours—for the ultimate users of our products.

Make This YOUR Creed for Saving in National Defense:

To practice strict economy in the use of metal, and to conserve every possible man-hour. All of us must eliminate waste. Only by so doing, can the necessary Defense Homes be built and the scarcity of metal for civil use be avoided.

Lamneck Products and the Sheet Metal Contractors can cooperate every step of the way in the vast Defense Housing Program. Lamneck Prefabricated Duct and Fittings are designed and produced with a minimum of waste. You can use Lamneck fittings without waste of time and material. They are particularly adapted to the requirements of the Defense Home. You automatically eliminate piece-meal shop work, scrap piles, misfits.

Let this be our common creed! CONSERVE! COOPERATE! Do everything we can, individually and collectively, to serve our National Interests!

LAMNECK FITTINGS ARE STOCKED AT YOUR NEARBY JOBBER'S

At present, line is complete; stocks are ample; deliveries prompt. Ask your jobber to show you the many advantages and savings available in ready-to-install Lamneck Fittings.

LP INC

Specify LAMNECK

LAMNECK PRODUCTS INC. Middletown, Ohio

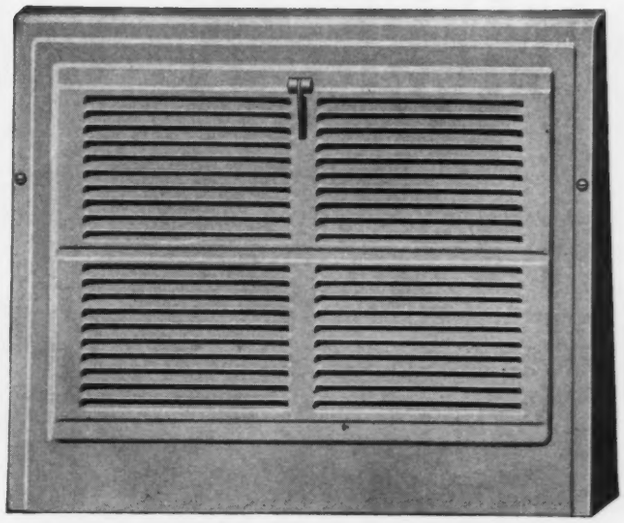
Simplified Furnace Pipe and Fittings and Prefabricated Duct and Fittings for all Types of Residential Gravity and Forced Warm Air Heating and Air Conditioning Systems.

A Really Handsome New

GRAVITY REGISTER

with

. . . air conditioning "lines"
. . . directional fins
. . . metallic finish

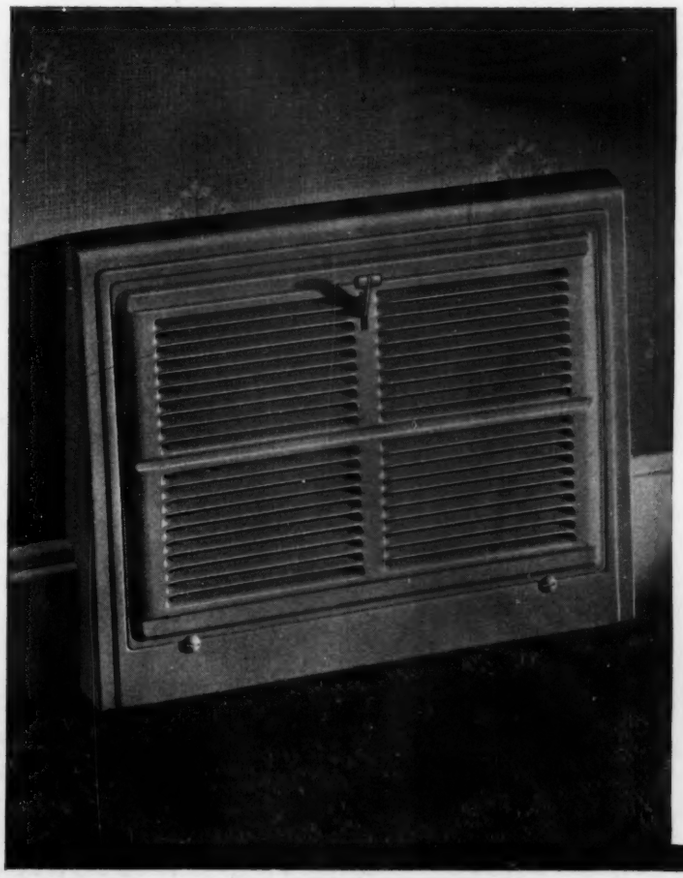


Heat-Rite 1-Piece Baseboard Register.

THE Auer Heat-Rite presents a degree of beauty heretofore unknown among gravity registers. Its ultra modern design—just a step ahead of the parade—has won widespread approval. The Heat-Rite features a fin type grille, with slightly downward directional fins, very efficient for most purposes, but also adjustable for other levels as desired. Generous open area for gravity jobs.

Here is a design which you can be proud to use on any new installation, and which is also highly adaptable for remodeling or conversion purposes, since dimensions are the same as older standard baseboard models, and thus adaptable to existing fittings. Made in 1 and 2 piece types for baseboard, also in wall registers and baseboard intakes. Now furnished in DuraTone lustrous metallic finish as well as standard finishes, and priced the same as ordinary gravity registers.

Heat-Rite Baseboard Register 2-Piece.



Ask for your copy of latest Auer Register Book showing all models for air conditioning and warm air. Special Grille Catalog "G" also sent on request.

THE AUER REGISTER COMPANY
CLEVELAND, OHIO

AUER
HEAT·RITE
Registers

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES and SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 110, No. 8 — August, 1941 — Founded 1880

CONTENTS

As We See the Picture 43
The Furnace Industry's Call to Washington 44
Amendments to the National Housing Act 45
FHA's Fall Program for Rehabilitation 46
Defense Developments Affecting Our Industry 48
Defense Heating (Gravity Furnace on First Floor) 50
Kruckman—Latest Defense Area Rulings 52
Three "Musts" to Successful Furnace Sales 89
Working the Wires to Homeowners 90
Association Activities 92
New Products 94
New Literature 100
With the Manufacturers 104
News Items 124

RESIDENTIAL AIR CONDITIONING SECTION

Commercial Ventilation with Housed Fans 55
Air Conditioning for Builders (Part 2) 58
1,000 Attic Fans Since 1937 62
Air Conditioning an Animal Hospital 64
Attic Fan Installation Details 67

THE SHEET METAL SECTION

Gundlach, Sandusky, Seeks Heavy Gauge Specialties 73
Shearing and Cutting in Streamlined Metal Training .. 77
Ingenious Copper-Wrapped Gutter Hanger 80
Dust Collecting System for Abrasives 82
30 Common Finishing Complaints—Their Remedies ... 85

In This Issue

SINCE everybody, everywhere, is giving most of their waking time to discussing the effects of the preparedness program on each individual's business, we devote more pages than usual to different aspects of this problem. Readers will find, we hope, a carefully selected, well-rounded list of articles having to do with preparedness in this issue.

●

We would like to call attention to Managing Director George Boeddener's report on the industry's call to Washington on page 44. And Arnold Kruckman's analysis of the "Defense Area" situation, page 52.

●

One article, especially timely we think, is the gravity-furnace-on-the-first-floor article on page 50. It seems to us that this builder and the heating contractor may have one answer to the question—"How can the warm air heating industry heat the under-$3000 house."

●

For those who hope business will continue to be good, we dedicate the article on page 46, in which our friend the FHA announces an aggressive program to rehabilitate old structures. Previously FHA has started several programs which have definitely benefited our industry.

We believe that this rehabilitation campaign is soundly conceived, eminently practical and a distinct contribution to the solution of the problem of housing defense workers. We urge every reader to help the campaign along.

●

And again, as in July, we devote two pages to Defense Developments of interest to or affecting our industry. Generally, these developments are more encouraging than discouraging.

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More than 8,000 copies of this issue are being distributed

SIGN UP FOR DEFENSE!

In case any of you fellers haven't gotten in touch with your local office of O. P. M. take this tip: Walk in, wire or write this outfit pronto. Here's why I say to do it:

The Office of Production Management in Washington has set up 36 of these local offices to *help you get defense contracts.* They've got a raft of dope on defense jobs bein' done and planned for in your area. *An' they can tell you just what sheet metal work is goin' to be let to subcontractors.*

What kind of work can you get? These pictures give you a good idea. For instance, take the guy weldin' a Monel cylinder. The order was for 185 separators like the one on the table. Each one had to have a set of three cylinders. The three kinds, in piles back of table, were made of Monel . . . 16 gauge perforated, 14 gauge with louver in center, an' 14 gauge with louver near top.

The reason they used Monel on this job: It's just the ticket for perforatin' an' punchin'. An' on top of that you can do a slick job of spot an' electric weldin' on Monel.

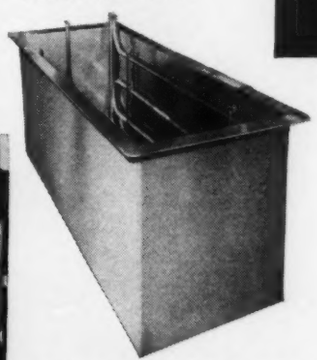
The tank with the heatin' coil was made for finishing metal in a plane plant. It's ¼ in. steel lined with 22 gauge Monel, atomic hydrogen welded. The coil was made from ¾ in. I.P.S. Monel tubin'; aerator from ½ in., an' overflow from 1½ in. Monel.

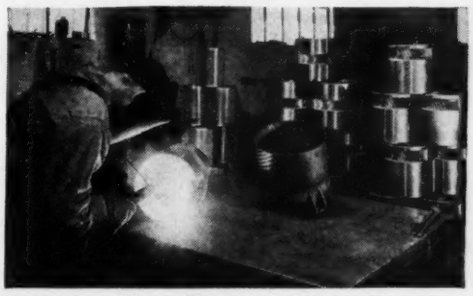
For a real cinch, just take a look at the pile of food trays. They're used for feedin' Uncle Sam's gobs an' the order called for 60. Butter an' salad trays were made out of 16 gauge Monel, steam table insert trays from 18 gauge . . . all #35 sheet, electric welded from start to finish.

Every sheet metal man wants to do his bit these days, so if you have any trouble findin' the nearest O.P.M. office drop me a line an' I'll dig up the dope an' send it to you right away.

FOOD TRAYS

FINISHING TANK





SEPARATOR CYLINDERS

Tim Shears

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

MONCRIEF

Enables You to Handle the Job Better

Every furnace or winter air conditioning job is different; and no matter what the requirements are, you can handle the job better if you are a Moncrief dealer. For in the complete Moncrief line you have just the type and size unit to fill the demands of the most discriminating home owner, or to meet the limitations of the modest budget.

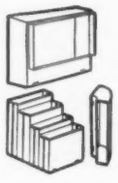
In Moncrief you are assured a reliable convenient source where you can get everything you need to conduct a prosperous and fully rounded out warm air heating and winter air conditioning business.

In addition, Moncrief provides a convenient Financing Plan which gives you three years to pay, no payment down and nothing to pay until October; a dependable Engineering Service to help you lay out heating plans and make estimates; and effective advertising literature and sales helps.

Get the details of the Moncrief Proposition.

The Henry Furnace & Foundry Co.
3473 E. 49th St. **Cleveland, Ohio**

MONCRIEF PIPE and FITTINGS



If you want pipe and fittings that fit—that go together as they are supposed to go, present a neat appearance and give long time satisfactory service, take on Moncrief. Made in two types, specially designed either for gravity or air conditioning. Moncrief Patented Lock Joints make wall stacks, stack heads, foot pieces and trunk duct fittings easy to install.

Send for Our Free Big Pipe and Fittings Books.

Square Cased
Cast or Steel Furnace

Series S
Steel Furnace

Series C
Cast Furnace

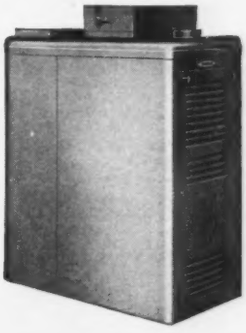
MONCRIEF SUPPLIES EVERYTHING USED ON A WARM AIR HEATING AND AIR CONDITIONING JOB

Complete Line of Furnaces and Winter Air Conditioners

Aristocrat Oil-Fired
Winter Air Conditioner

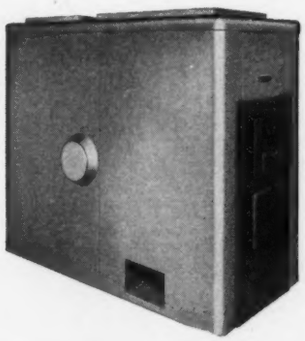
Utility Oil-Fired
Winter Air Conditioner

Special Oil-Fired
Winter Air Conditioner



Moncrief Gas-Fired
Winter Air Conditioner

DST Stoker-Fired
Gravity Furnace



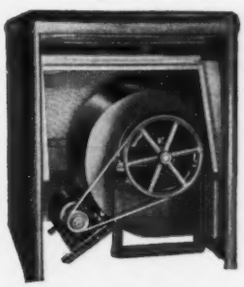
ST Stoker-Fired
Winter Air Conditioner

Aristocrat Cast Coal-Fired
Winter Air Conditioner

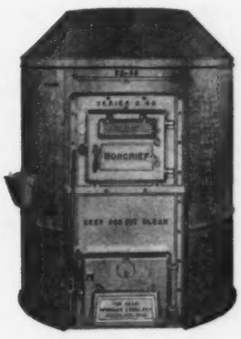
Aristocrat Steel Coal-Fired
Winter Air Conditioner

Series E
Steel Furnace

LongLife Furnace
Cast or Steel



Moncrief Blower-
Filter Unit

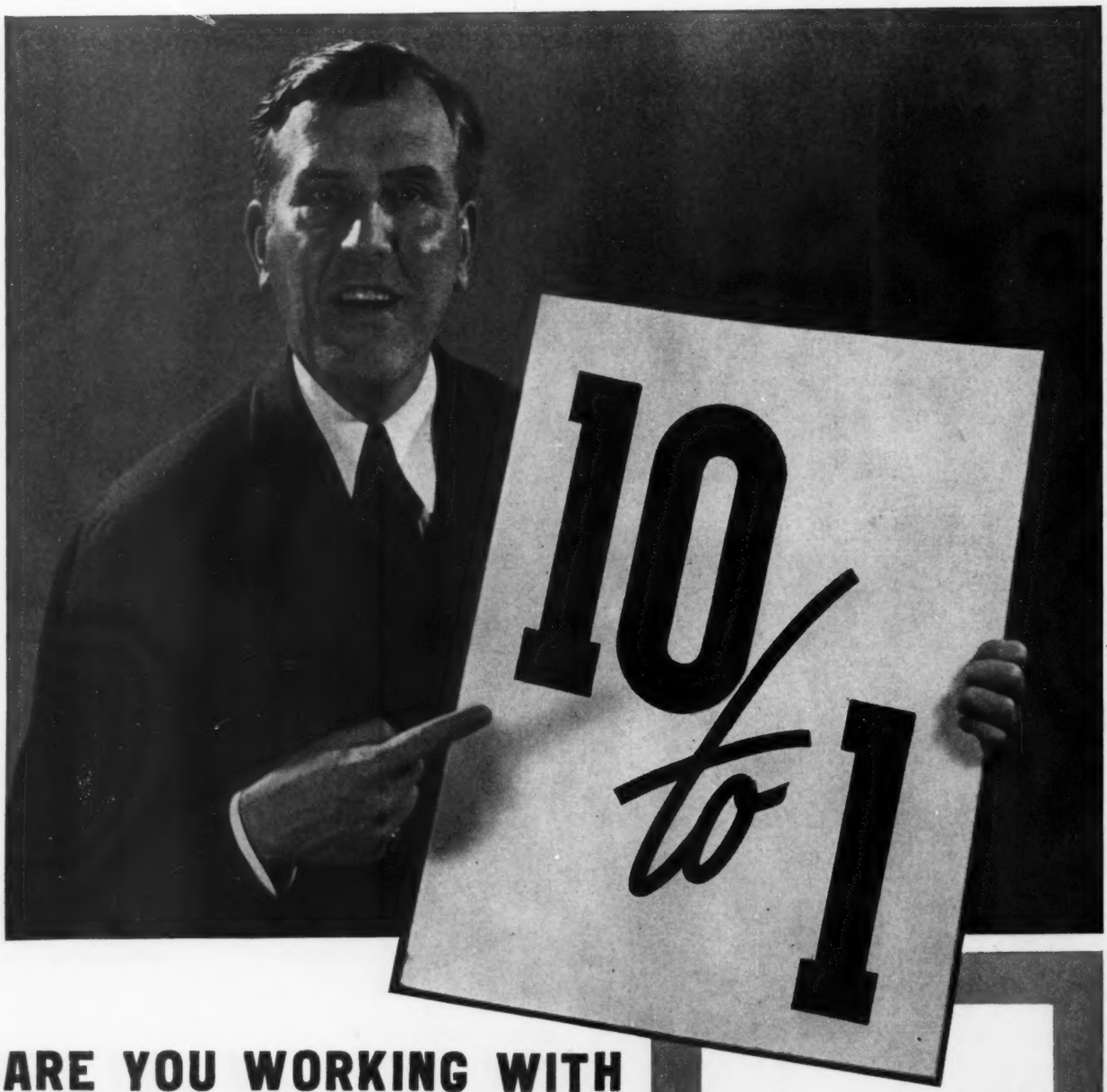


D-40 Steel
Furnace

DeLuxe LongLife
Cast or Steel

THE HENRY FURNACE & FOUNDRY CO.

3473 E. 49th STREET, CLEVELAND, OHIO



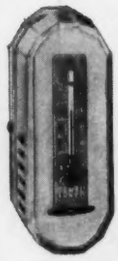
ARE YOU WORKING WITH OR AGAINST THESE ODDS?

HAND fired heating plants in your community outnumber automatic jobs 10 to 1. In new construction THREE out of FOUR homes and small buildings are hand fired, too.

If you're selling the Cook line of Simplified Temperature Control Systems you're working WITH the odds that give you a 10 times better chance to make sales.

Why not get in on the big business, the active business, the profitable business now . . . today? Write us. We'll show you how when you're a Cook dealer you can make 10 sales, 10 satisfied customers, 10 big profits out of every 11 prospects you have.

Write for these profit pointing books today! "How to Sell Heating Appliances" and the NEW Cook catalog, "Simplified Temperature Controls."



Temper-Tuner

Here are the big convenience and economy features of the "400" Heat Regulator Set:

Syncro-Action for perfect synchronization of rate of combustion of any solid fuel with any heat requirement.

No danger of overheating or fire. Current failure or blown fuse causes safety feature to close draft and open check insuring complete safety.

Clutch puts damper arm in neutral position with draft and check closed for smokeless and gasless firing. No service. No gears to grind, no bearings to oil, no batteries to wear out. Guaranteed for five years.

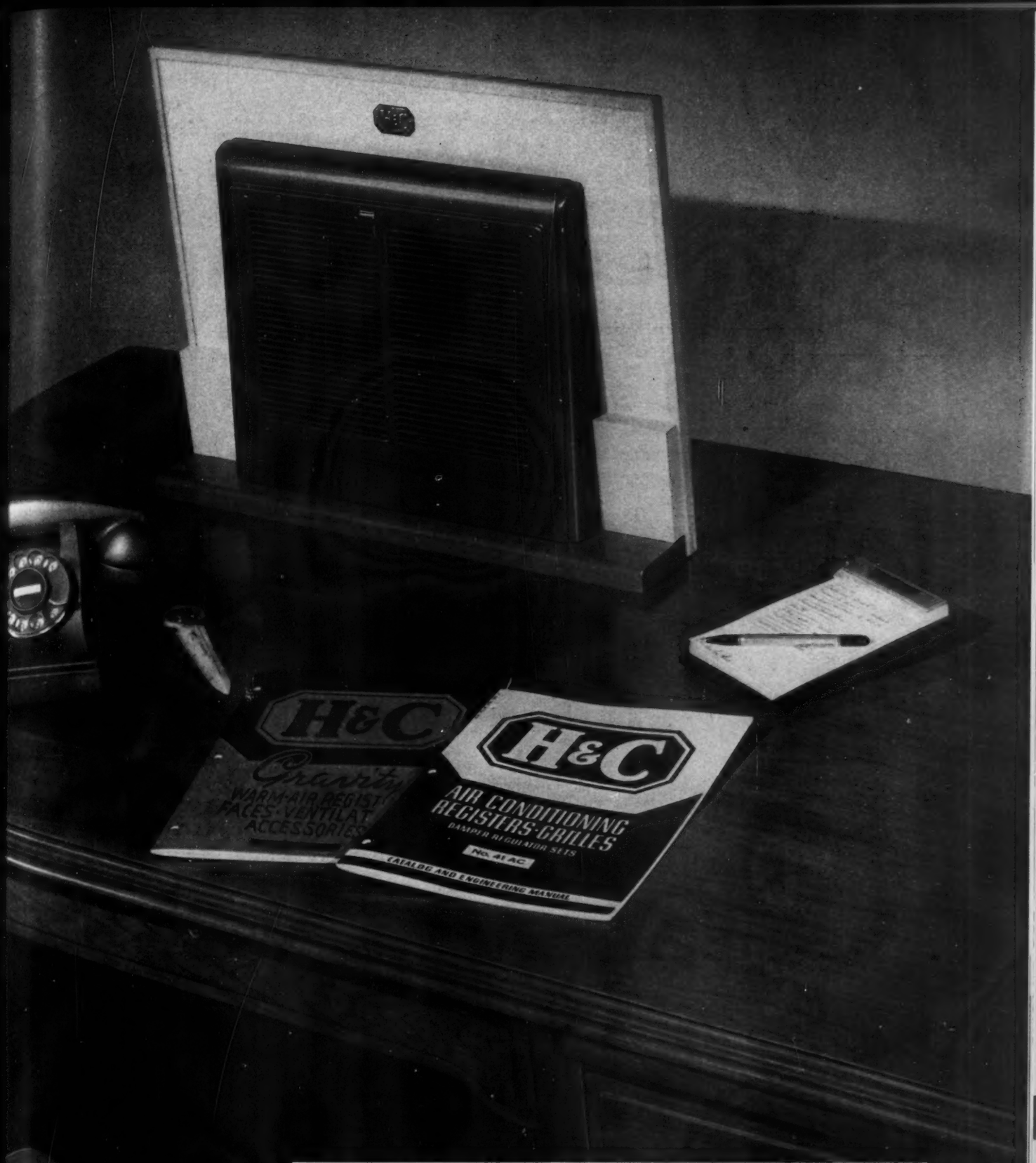
The "400" Heat Control Set includes everything needed for quick, easy installation. Modern design and styling.

COOK TEMPERATURE CONTROLS

Appliance Division

Cook ELECTRIC COMPANY

2700 SOUTHPORT AVE. • CHICAGO



AN ALERT BUYER SITS AT THIS DESK

Current Catalogs· No. 41 (Gravity Registers) and No. 41AC (Air Conditioning Registers). If not on hand, write us.

Register Shown No. 130 Series Gravity Conversion Register

HART & COOLEY MANUFACTURING CO.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulleys

HOLLAND H&C **MICHIGAN**

Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.

Western Representatives: John T. Rowntree Co., Los Angeles, San Francisco, Portland, Seattle, Salt Lake City, Denver

APPROVED

by Osborn

STEEL, IRON, STAINLESS, ALUMINUM, COPPER, ZINC AND PERFORATED SHEETS

TIN AND TERNE PLATE

TROUGH, GUTTER AND CONDUCTOR PIPE

AIR CONDITIONING AND WARM AIR FURNACES

REGISTERS

FURNACE PIPE AND FITTINGS

ASBESTOS AND ASPHALT ROOFING AND SIDING

VENTILATORS AND VENTILATING FANS

TOOLS AND MACHINERY

Many people will say that the function of a sheet metal distributor is simply to warehouse merchandise and sell it. But, is that all there is to the job?

As we see it here at OSBORN'S, our work and responsibility begins at the time any new product is introduced to the trade. By carefully checking and investigating such a product's construction, advantages and performance, we are able to determine its true worth for both our customers and ourselves. When our own standards are fully met—and not until—it is added to the OSBORN stocks.

As a result of this policy, the materials, tools and machinery available from our four warehouses are among the best to be had in the industry. They include, of course, the reliable, nationally known brands which the trade has looked upon as "tops" for years and years.

This is but another reason why Osborn has been regarded as a dependable source of supply since 1859.

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO
BUFFALO • CINCINNATI • DETROIT
Distributors of Metals and Metal Products

A DEPENDABLE SOURCE OF SUPPLY FOR 82 YEARS

Check the reasons why dealers sell

SUNBEAM

WARM-AIR FURNACES AND WINTER AIR CONDITIONERS

- ☐ A complete line of Furnaces for all fuels.
- ☐ A complete line of Winter Air Conditioners for all fuels.
- ☐ Preferred by leading Architects and Builders. Sizes for Small Homes.
- ☐ Convenient jobbers' warehouse stocks everywhere.
- ☐ A sales-stimulating Easy Payment Plan.
- ☐ A program of consumer advertising.
- ☐ Complete assortment of colorful dealer helps.
- ☐ More Heating Contractors sell Sunbeam than any other make.
- ☐ Backed by the best known name in Heating and Plumbing.

AMERICAN HEATING EQUIPMENT COSTS NO MORE THAN OTHERS

WRITE TODAY FOR THE NAME OF THE SUNBEAM JOBBER NEAREST YOU

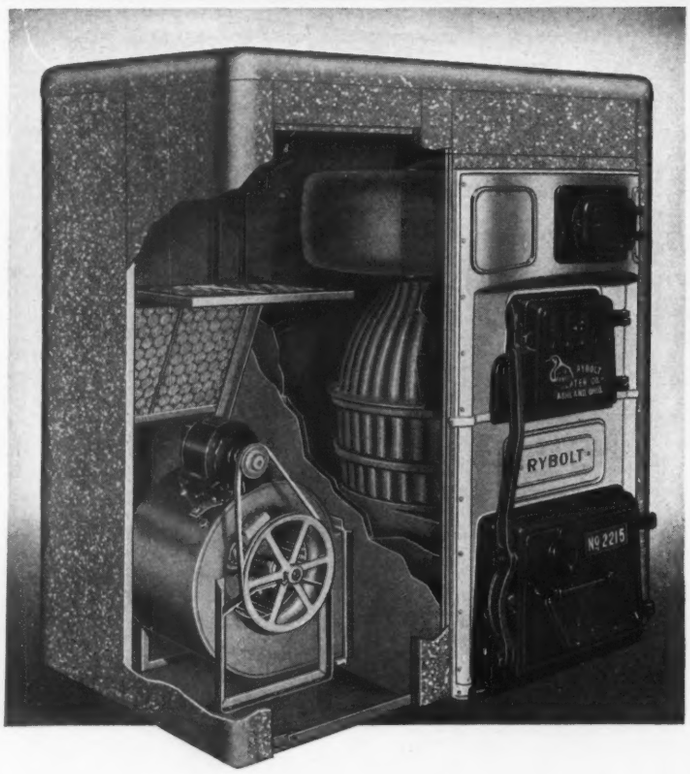
AMERICAN RADIATOR & Standard Sanitary

New York CORPORATION Pittsburgh

Copyright 1941, American Radiator & Standard Sanitary Corporation

★ ★ DEFEND OUR COUNTRY. ENLIST NOW IN THE U. S. REGULAR ARMY ★ ★

RYBOLT



RYBOLT Series 151—Winter Air Conditioner—Cast Iron Coal-Fired

Redesigned and thoroughly modernized, Series 151 represents a new high in operating efficiency, convenience and economy. Has the well known RYBOLT Series 15 Coal-Fired Furnace for its heating element. Special new features include the full height reversible blower cabinet which can be placed on either side of the unit. A high quality automatic heating unit throughout. Compact and attractive. Casing is handsomely finished in smooth gray Hammerloid enamel. Inner casing baffles. Standard equipment includes blower with top-mounted motor and variable speed pulley, thermostatic blower switch and Dust-Stop filters. Comes in 4 sizes.

TRADE MARK

IT TAKES 3 TO MAKE AN *Automatic Heating Sale*—

You, Your Customer and the MANUFACTURER

WHEN two minds are brought together in the agreement that constitutes a sale of Automatic Heating equipment the fusing point is the product itself.

The manufacturer, therefore, is a vital factor in the transaction. Realizing this fact, new units and advanced features and refinements are constantly being added to the RYBOLT line to make it stronger and more complete.

That's why, in the RYBOLT line, you can always find the type of up-to-date unit to meet the requirements of all customers satisfactorily, regardless of the limitations of price, space or fuel. That's our part in your sales picture and we accept the responsibility accordingly.

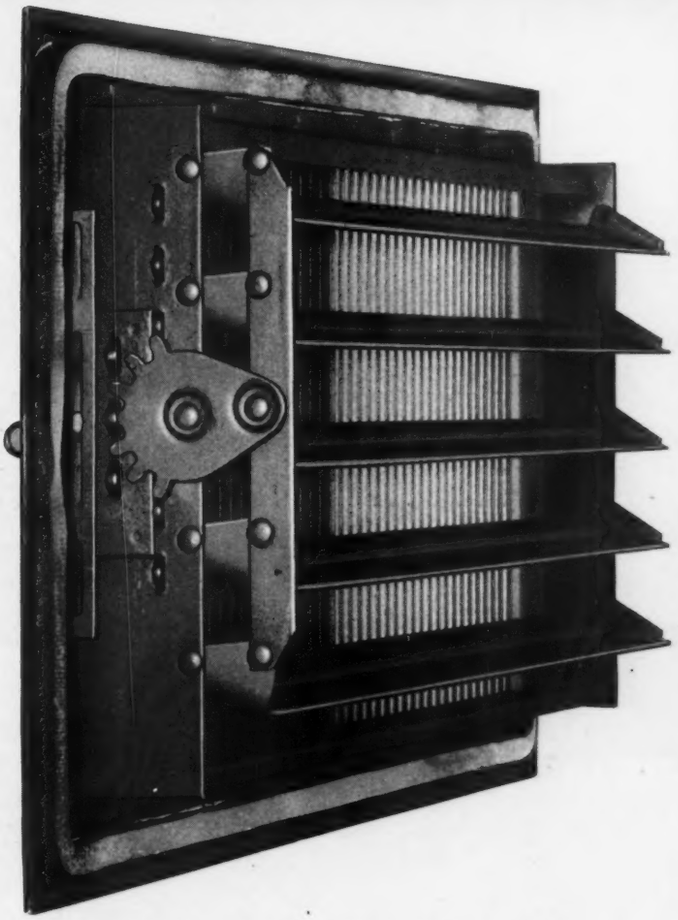
Watch for announcements soon of new RYBOLT units.

WRITE FOR *set of folders covering the complete RYBOLT line of Winter Air Conditioners and Warm Air Furnaces.*

THE RYBOLT HEATER COMPANY

615 MILLER STREET • ASHLAND, OHIO

WHY U. S. No. 256 Air Conditioning Registers WILL DO A BETTER JOB FOR YOU



FACT No. 1 The Multiple-Valve construction of U. S. No. 256 allows the home owner to secure any deflection of air current desired WITHOUT SHUTTING OFF THE REGISTER. It is easy to understand, easy to operate.

U. S. No. 256 ALLOWS EVERY ANGLE UP-FLOW to 45° DOWN-FLOW

Ordinary Swinging Shutter Type Register can be set for only 3 POSITIONS

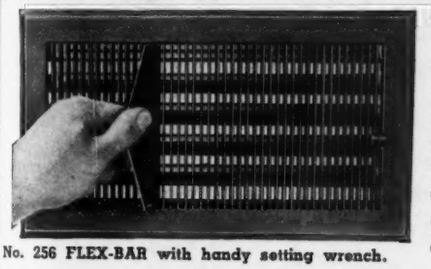
Rear View of the No. 256 U. S. The Smooth-Powerful-Geared Operator motivates the Valves to any Angle of Air-Flow or Volume required.

A partial closing of Operating Lever does not close off the Register or dump all the Air Stream perpendicularly downward.

The lever Operation of the No. 256 Performs just as expected of a register! It controls and Valves the Air-Flow.

A SAFE EFFICIENT REGISTER

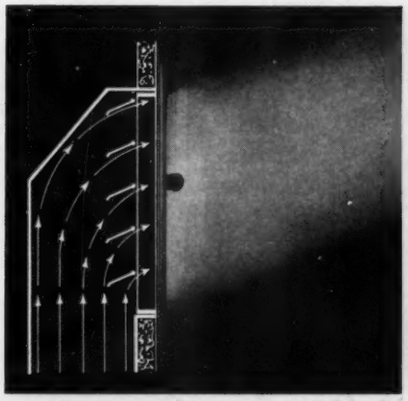
FACT No. 2 U. S. No. 256 is the most Practical and Perfectly Constructed Four-Way Flow Register, which truthfully accomplishes All that we claim for it. The Grille-Bar setting can be changed any number of times without damage to Grille or Finish. There is no center mullion to obstruct the air-flow.



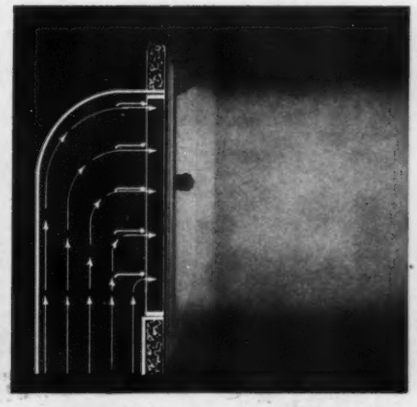
No. 256 FLEX-BAR with handy setting wrench.

FACT No. 3

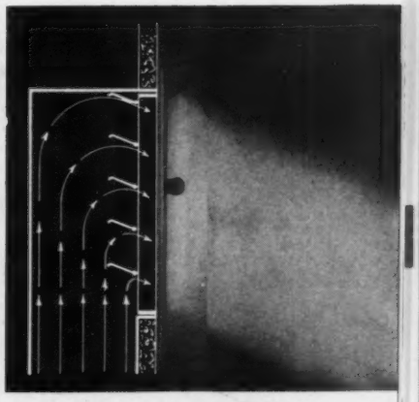
U. S. No. 256 can be used with any style stackhead as illustrated below. It gives full grille air-flow distribution with minimum resistance.



Multiple-Valves set for 22° Up-Flow. Up-Flow may be increased to any Greater Degree of Up-Flow if required.



Multiple-Valves set for Straight Flow through Register Grille. Note Air-Flow over ENTIRE GRILLE SURFACE.



Multiple-Valves set for 22° Down-Flow Any Greater Down-Flow may be ha to 45°.

SEND FOR 41AC CATALOG

UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

CANADIAN MANUFACTURING DISTRIBUTORS — Canada Register & Grille Co., Ltd., Toronto, Ontario

Automatic Heating is Es

MINNEAPOLIS-HONEYWELL UNDERTAKES THE JOB OF HELPING EDUCATE THE NATION ON THE IMPORTANCE OF THE HEATING INDUSTRY TO DEFENSE

MINNEAPOLIS-HONEYWELL has decided to switch the appeal of its large national campaign in magazines, and national billboard posters, now devoted to a general industry theme, to this important cause. In other words, M-H advertising will inform the nation and the government of the great Fuel Conservation and Health advantages of Automatic Heating.

Home owners will be urged to have their present heating equipment checked for efficiency by their own heating merchants, and, if necessary, to install new equipment, so that they may cooperate fully with the government in its Defense Program.

To make this campaign successful, every dealer in his own territory should do his bit. To that end, Minneapolis-Honeywell has prepared, and is ready to supply free of charge, newspaper mats, direct mail pieces, display pieces, and radio continuities, emphasizing the Health and Economy of Automatic Heating. These are so designed that they will appear over your own name, featuring your own products.

We earnestly urge you to put your shoulder to the wheel in this campaign, to do everything within your power to gain the recognition for yourself and your Industry that Automatic Heating deserves as a Defense aid.

Minneapolis-Honeywell Regulator Company, Minneapolis, Minnesota

AUTOMATIC HEATING and AUTOMATIC CONTROLS are Essential

THEY Save FUEL
PROTECT
HEALTH

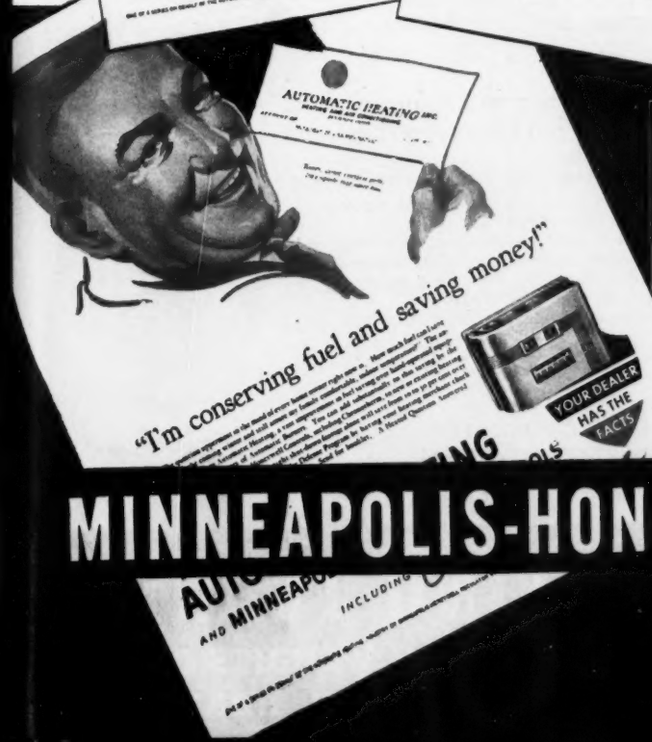
...is Essential to Defense!

75,000,000 READERS OF ADVERTISEMENTS
Appearing in

Saturday Evening Post	*Seven Full Pages*
Life Magazine	*Two Full Pages*
Better Homes and Gardens	*Two Pages in Color*
American Home	*Two Pages in Color*
House Beautiful	*Two Pages in Color*
House and Garden	*Two Pages in Color*

PLUS 3,000 BILLBOARDS
in September and October, from New York to California

TWO IMPORTANT
Contributions to Defense
1 · CONSERVATION OF ALL TYPES OF FUEL
• The Automatic Heating Industry provides home owners with the means for cooperating fully with the spirit and purpose of our Government's Defense Program. Modern Automatic Heating, with its efficient, economy equipment, extracts all the usable heat units from the fuel it burns.
2 · PROTECTION OF HEALTH AND EFFICIENCY
• Modern Automatic Heating maintains comfort temperature, protects health, and increases efficiency. It saves fuel — Minneapolis-Honeywell Controls, including Chronotherm, save more fuel. Consult your heating merchant on ways and means to bring your heating equipment to highest operating efficiency. Ask him about Automatic Heating with Minneapolis-Honeywell Controls, including Chronotherm.
by AUTOMATIC HEATING
AND MINNEAPOLIS-HONEYWELL Controls
INCLUDING Chronotherm
THE NEW CLOCK THERMOSTAT THAT SAVES FUEL
YOUR DEALER HAS THE FACTS
ONE OF A SERIES ON BEHALF OF THE AUTOMATIC HEATING INDUSTRY BY MINNEAPOLIS-HONEYWELL REGULATOR CO., 1944 FOURTH AVE. S. MINNEAPOLIS, MINN. AND 178 PETER ST. TORONTO, ONT., CANADA



MINNEAPOLIS-HONEYWELL REGULATOR CO.

A bird's-eye view

OF AN EASY WAY TO PROFIT

Portion of the Metropolitan Club
Washington, D. C.

A Taylor Terne Roof with over 40 Years of Service!

Take a good look at this Taylor Roof—for it gives you the right slant on bigger roofing profit.

You'd never believe that it's more than forty years old. It doesn't show it—it looks good and is good for many more years. And when you hear how well it has done its job, you'll say a roof like that is a cinch to sell.

This Taylor Terne Roof was laid—easily and quickly—back in the 19th Century. Its low first cost has been the *only* cost, except for periodical painting. It has been weatherproof all these years. It has protected this building from fire hazards—safeguarded it from lightning. It has helped save on insurance costs.

Taylor Roofing Ternes have been giving enduring and economical service since 1810. They are made of copper-bearing steel, coated with a lead-tin alloy. Assembled, they form a roof that's watertight—that won't crack, chip or warp—that's unaffected by extremes of temperature—that can look new year after year.

There's money in roofing—if you build your business on Republic Taylor Ternes.

We'll Help You Build Your Roofing Business

Booklet 365 gives you all the selling points of Republic Taylor Ternes to help you close more prospects. It lists gauges and sizes in sheets and rolls, various weights of coatings and methods of application. Write now for a copy and for the name of your nearest jobber.

REPUBLIC STEEL
DEFENSE FOR AMERICA

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

BERGER MANUFACTURING DIVISION • CULVERT DIVISION
NILES STEEL PRODUCTS DIVISION • STEEL AND TUBES DIVISION
UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

REPUBLIC TAYLOR ROOFING TERNES

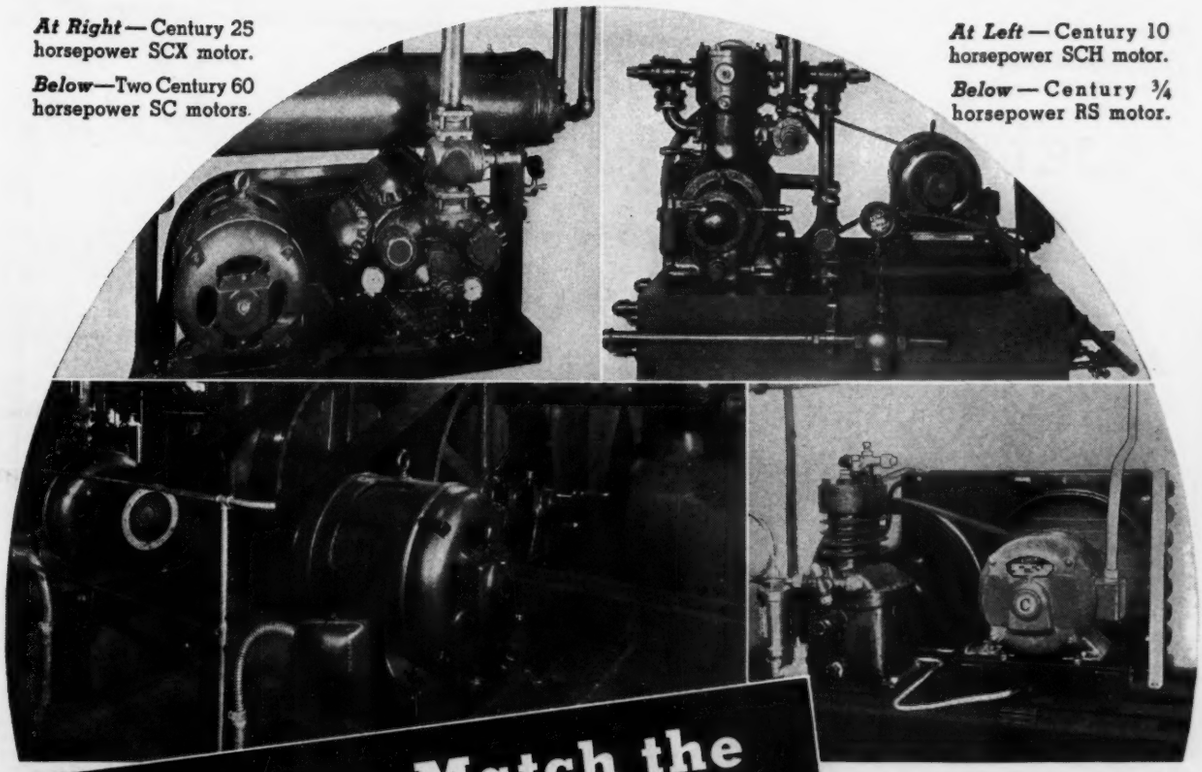
FLAT SHEETS—PAINTED OR UNPAINTED ROLLS—SIX WEIGHTS OF COATING TO SELECT FROM—AND TARGET AND ARROW BRAND

At Right — Century 25 horsepower SCX motor.

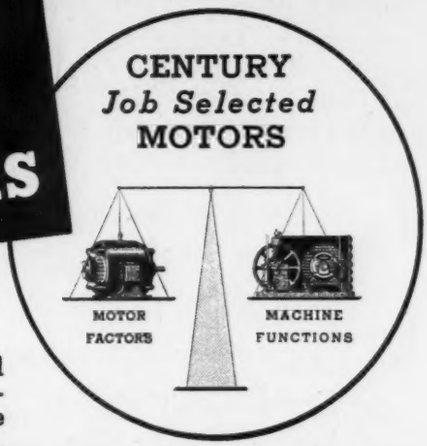
Below—Two Century 60 horsepower SC motors.

At Left — Century 10 horsepower SCH motor.

Below — Century ¾ horsepower RS motor.



It Pays to Match the Motor to the Job with CENTURY *Job Selected* MOTORS



● Century Job Selected Motors have won wide acceptance throughout the air conditioning and refrigeration field because it is recognized that a Century recommended motor accurately matches the specialized requirements of the installation. And because the motor fits the job it contributes to improved performance, economical operation and user satisfaction.

For example: ***Century Type SCX Squirrel Cage Motors*** are especially designed and engineered for such applications as centrifugal pumps, air conditioning fans and blowers where low starting current is an essential requirement. They help solve problems arising from the shock of heavy starting current, save money on expensive motor control accessories.

Century Type SCH Squirrel Cage High Torque Motors are unusually quiet in starting, accelerating and running. In addition they provide the high torque necessary to bring the modern compressor up to full speed without overmotoring the running load.

Century Type RS Single Phase Motors also provide the advantages of high starting torque and low starting current. They assure least light flicker and voltage drop, factors that improve performance in any compressor installation.

Century Job Selected Motors are available in various types and sizes from fractional to 600 horsepower — they meet the exacting demands of every phase of air conditioning and refrigeration applications. Your Century Motor Specialist will gladly give you full details — see him today.

CENTURY ELECTRIC COMPANY

1806 Pine Street St. Louis, Missouri

Offices and Stock Points in Principal Cities

Century MOTORS

One of the Largest Exclusive Motor and Generator Manufacturers in the World

Get Profitable "Fall Check-Up" Business . . . and Avoid Frequent Call-Backs . . .

with

RESEARCH AIR FILTER

Forced-Air Heating Plants Need New Filters Soon . . . Make This Your Entering Wedge for Repair Jobs!

Filters provide the ideal approach for those fall service calls . . . the profitable check-ups you should make on every one of your installations during August and September!

And with Research Air Filters, you get these extra benefits!

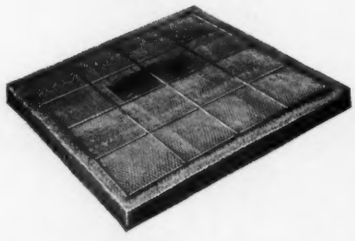
*Enough profit on filter installation alone to pay for the check-up.

*Higher heating-plant efficiency with better filtering and lower air-flow resistance.

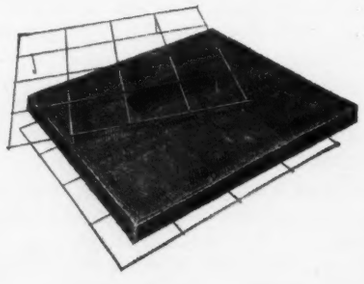
*Longer filter life — fewer complaints, fewer call-backs.

For fall service profits, build your check-up business around Research Air Filters!

Two Views of One Research
RE-FIL-ABLE Air Filter



This is one of several types of Research Air Filters used in warm air furnaces, air conditioning units, and filter banks. Below: Filter pad and hooked wire grids disassembled.



WRITE FOR COMPLETE DATA SHEETS

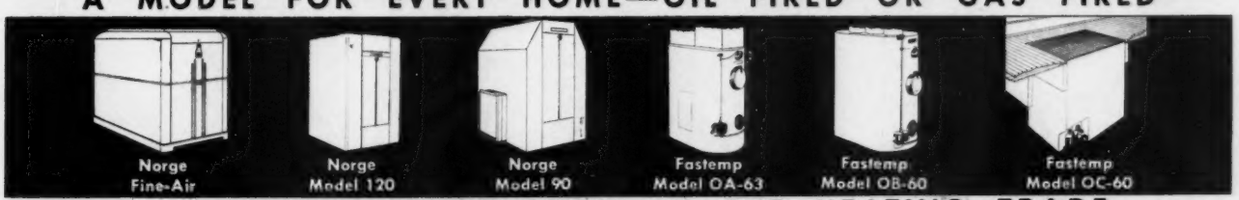
Full information on Research Air Filters . . . your ideal way to give better customer-service with fewer service calls. Write for data sheets today!

RESEARCH PRODUCTS CORPORATION

Madison **Wisconsin**

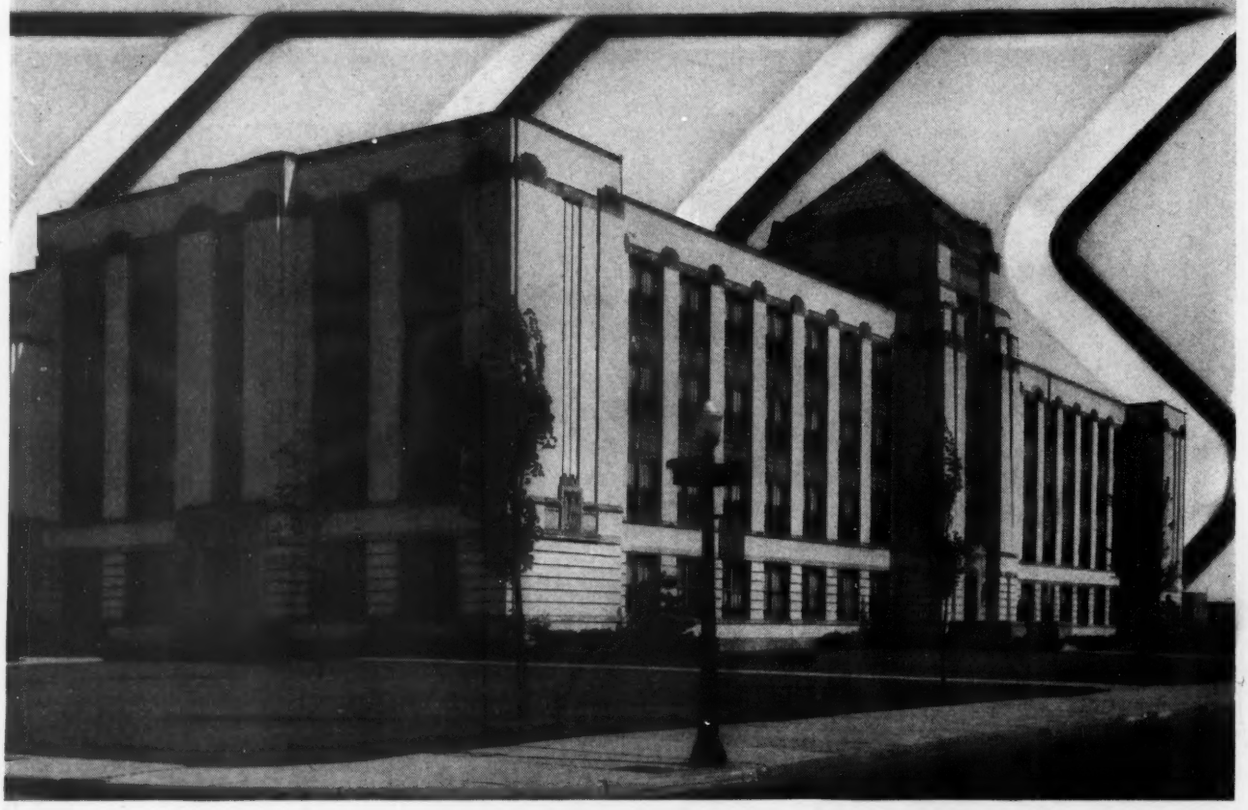
LOOK — ANOTHER NEW NORGE "PACKAGE" — DESIGNED ESPECIALLY FOR DEFENSE HOMES
AND WHAT'S MORE, IN SPITE OF HEAVY SHIPMENTS, EVERY NORGE MODEL IS AVAILABLE FOR IMMEDIATE DELIVERY
New MODEL OD-70 COMPLETELY AUTOMATIC; PRESSURE VAPORIZING; ONLY 26" SQUARE; PRICED FOR DEFENSE HOMES . . .
Model OD-70 is only 26" square and 67" high; is quickly and easily installed in basement or utility room. Bottom or side inlet, top discharge. Develops 70,000 B.T.U. at the bonnet and delivers 800 c.f.m. All controls fully automatic. Two-stage mechanical draft oil-burner listed as standard by Underwriter Laboratories and fully approved for CS-75. Completely factory wired. Beautiful pearl gray baked enamel finish. Streamlined cabinet. 15 models ranging from 60,000 B.T.U. to 165,000 B.T.U. bonnet output, backed by two of the greatest names in American industry—Norge—Borg-Warner. Immediate delivery. Write or wire.
NORGE HEATING & CONDITIONING DIVISION
BORG-WARNER CORPORATION
12345 KERCHEVAL AVE. • DETROIT
See NORGE before you buy!

A MODEL FOR EVERY HOME—OIL FIRED OR GAS FIRED



FOR IMMEDIATE DELIVERY TO THE HEATING TRADE

FOR THIS SCHOOL... *Positive Protection*
WITH ANACONDA THROUGH-WALL FLASHING



Beautiful new Kensington High School, Buffalo, New York, completely protected by 3500 pounds of Anaconda Through-Wall Flashing and an unusual batten-seam type Anaconda Sheet Copper roof on its tower. Daniel G. McNeil was the supervising architect for the Board of Education; Joseph A. Sanders & Sons, Inc., Buffalo, the sheet metal contractor.

This copper flashing is easy to install, efficient and positive, yet relatively inexpensive

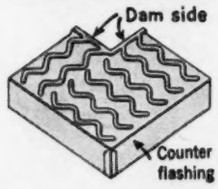
Made of 16-oz. copper, Anaconda Through-Wall Flashing offers these clean-cut advantages:

1. The $\frac{7}{32}$" high zig-zag corrugations provide superior bond with the mortar in all lateral directions.
2. An integral dam throughout each length gives complete drainage in the desired direction. *This flashing will drain itself dry on a level bed.*
3. The flat selvage permits neat, sharp bends for counter-flashing or locking to adjacent sheet metal without distorting the flashing or interfering with free drainage.
4. Anaconda Through-Wall Flashing is easily locked endwise even with the edges bent, merely by nesting one or two corrugations. Such joints are water-tight because of the raised corrugations.

ANACONDA
from mine to consumer

4172

INSIDE CORNER FLASHING



Standard inside corner flashing unit. Dam on inside, drains out.

OUTSIDE CORNER FLASHING

Standard outside corner flashing unit. Dam on outside, drains in.

Anaconda Copper

THE AMERICAN BRASS COMPANY — General Offices: Waterbury, Conn.
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

MUELLER *presents*

another timely addition to your "best-seller" line of gas-fired equipment

New Cabinet-type All-cast-iron Gas-fired Winter Air Conditioner

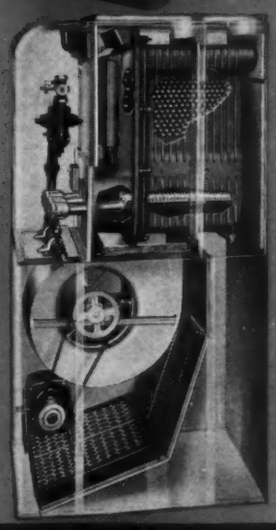
This new ALL-CAST-IRON unit is sectional in construction, with a separate burner and inspirator for each section — to assure effective heat transfer.

— BUT the castings are so assembled that the burners and combustion chambers of the different sections are intercommunicating, requiring only one pilot.

Return air is incorporated within the cabinet. The entire volume of air passes over the heat exchanger not once, but twice, assuring complete exposure to the heated surfaces.

Standard Mueller quality — backed up by the advertised Mueller name — assures you of your customer's long-run satisfaction.

You're equipped to handle *any* job, with the complete Mueller line. You can sell the added comfort, convenience, and healthfulness of automatic heat with winter air conditioning to people with very modest budgets — and make more money. Tie up with Mueller, for a successful furnace business. If you do not know your Mueller distributor, write us for his name. Ask for Mueller's illustrated literature. *L. J. Mueller Furnace Company, 2010 W. Oklahoma Ave., Milwaukee, Wisconsin.*



SERIES CVP

Cut-away View

Note how burners intercommunicate, requiring only one pilot. Roomy control compartment gives easy access. Attractive insulated cabinet. Unit equipped with fan, filters, and automatic humidification. Built in four sizes (2 to 5 sections inclusive).

D-18

MUELLER also announces the SEASONSTAT. All Mueller automatic equipment may now be obtained with this new control which revolutionizes automatic winter air conditioning.

MUELLER *Milwaukee*

HEATING AND AIR CONDITIONING

Oil NEW VERTICAL OIL FURNACE, SERIES OVP, with winter air conditioning and Mueller Vaporizing Oil Burner. Efficient, economical.

Coal SERIES FB CAST IRON FURNACE with winter air conditioning. Modern styling. Dependable, economical performance.

INFORMATION
PUBLISHERS' REPRESENTATIVES
Please do not ask for an interview unless prepared to submit verified facts and figures in accordance with our standards of circulation values.
ADVERTISING MANAGER

A BUSY SPACE BUYER suggests displaying this sign in the lobby of every advertiser and advertising agency.

Well—why not?

THE days of blind space buying are over. To ask an advertiser to select media on the basis of unsupported facts and figures is like asking him to sign a blank check.

Today advertisers have definite standards for circulation values. They want to know, by these standards, how much circulation a publication has, where it goes, how it was obtained, how much the readers paid and many other facts that bear on the advertising value of a business paper. With these facts, verified, advertisers can select media intelligently and buy space with assurance that they will get what they pay for.

To cooperate with advertisers and tell our circulation story by their own standards we belong to the Audit Bureau of Circulations, a cooperative organization of advertisers, advertising agencies and publishers. Our A. B. C. report giving complete and audited information about our circulation is the advertisers' assurance that their advertising investments are protected by known, verified values.

A. B. C. PROTECTS YOUR ADVERTISING

Paid subscriptions, renewals, evidence of reader interest, are among many facts in A. B. C. reports that are definite guides to effective media selection. When you buy space in A. B. C. publications your advertising is safeguarded by audited circulation. Always ask for A. B. C. reports.

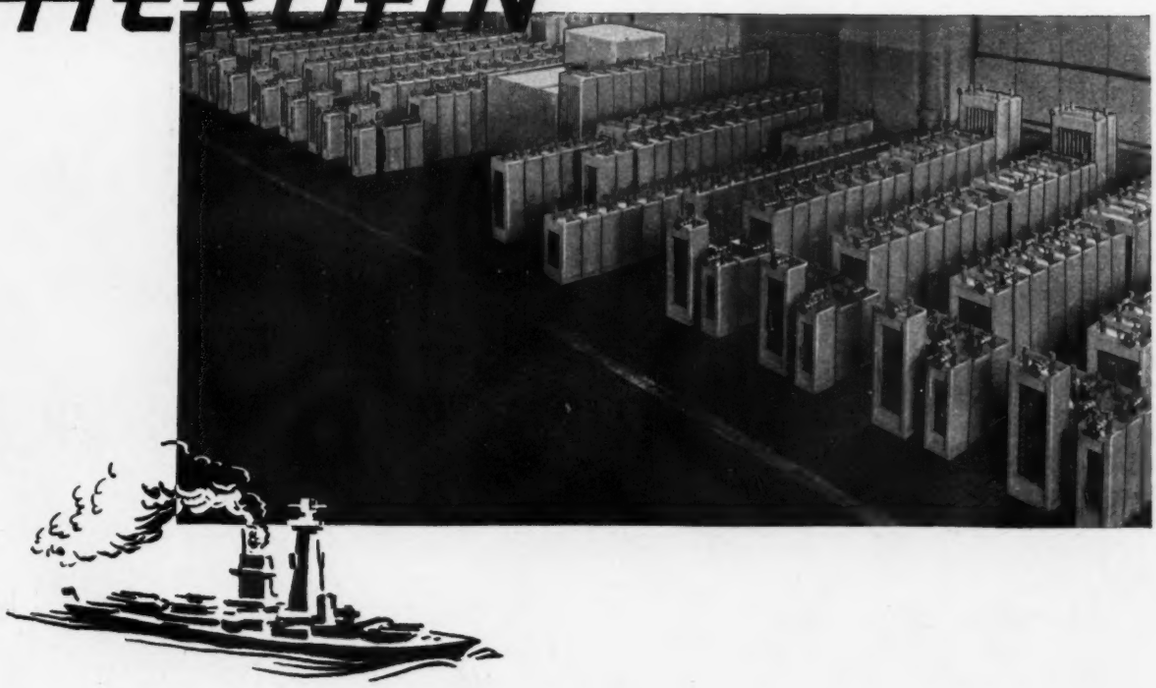
AMERICAN ARTISAN

6 North Michigan Ave. **Chicago, Ill.**

Member of the Audit Bureau of Circulations ABC *Ask for a copy of our latest A. B. C. report*

A. B. C. = AUDIT BUREAU OF CIRCULATIONS = FACTS AS A MEASURE OF CIRCULATION VALUES

AEROFIN



THEY DON'T NEED A FIREPLACE ON A CRUISER

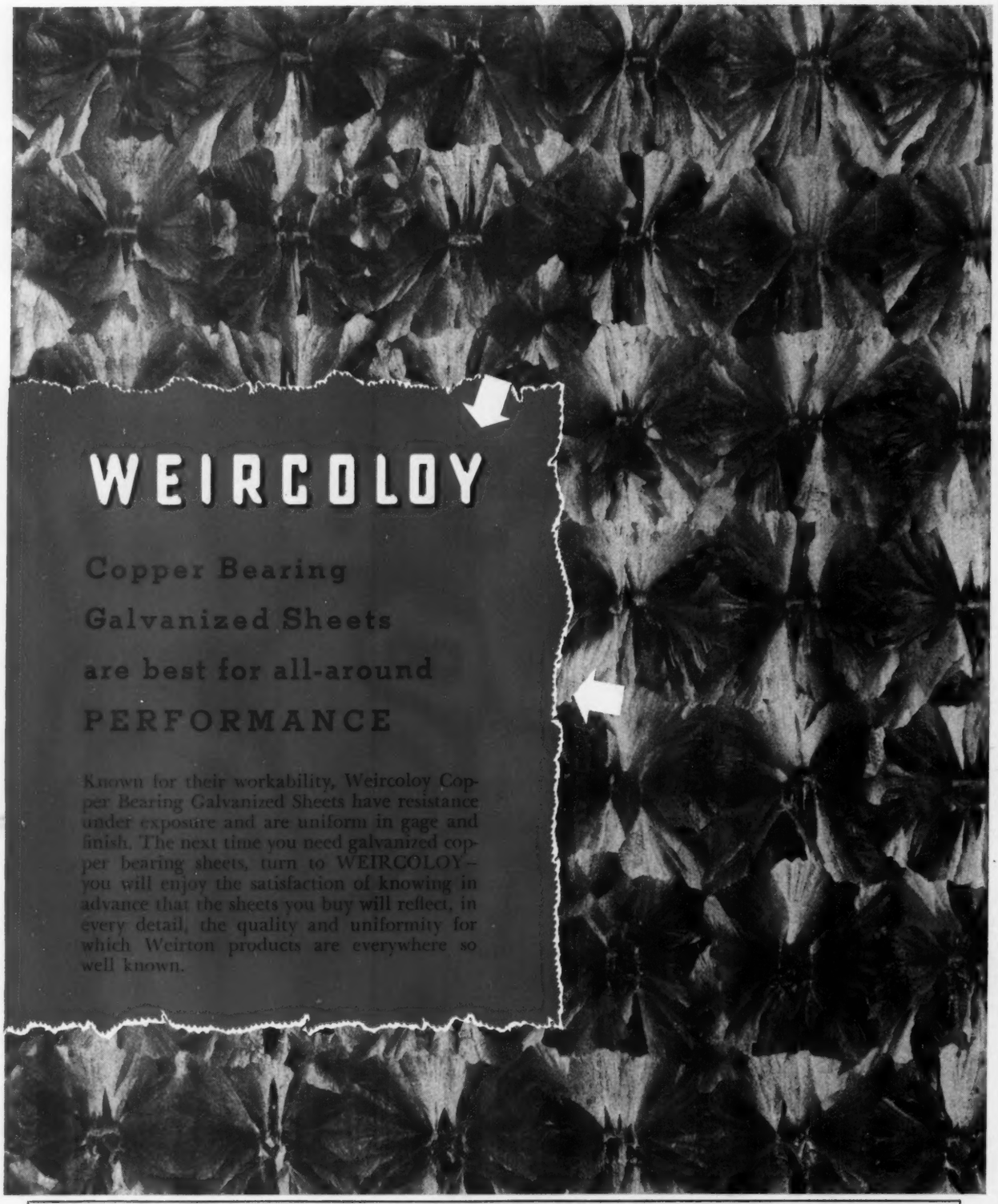
★ These Aerofin heating coils are destined for U. S. Navy destroyers and cruisers—an assurance that officers and men will be warm under all conditions. Long life, durability under severe usage, exceptional efficiency, and instantaneous heat transfer are a few of the reasons why the Navy accepts Aerofin.

★ Although your heating requirements may not call for coils that meet Navy specifications, you can be sure of the same guarantee in ALL Aerofin coils. Before shipment, EVERY Aerofin heating coil is tested to 400 pounds of air under water, 1000 pounds hydrostatic—and guaranteed for 200 pounds of steam working pressure and 388° F. working temperature. For certainty in operation—specify AEROFIN.

AEROFIN CORPORATION

410 S. GEDDES ST., SYRACUSE, N. Y.

CHICAGO • DETROIT • NEW YORK • PHILADELPHIA • DALLAS • CLEVELAND • TORONTO


WEIRCOLOY
Copper Bearing
Galvanized Sheets
are best for all-around
PERFORMANCE
Known for their workability, Weircoloy Copper Bearing Galvanized Sheets have resistance under exposure and are uniform in gage and finish. The next time you need galvanized copper bearing sheets, turn to WEIRCOLOY—you will enjoy the satisfaction of knowing in advance that the sheets you buy will reflect, in every detail, the quality and uniformity for which Weirton products are everywhere so well known.

LIST OF PRODUCTS

Bars . . . Angles . . . Structurals . . . Piling . . . Hot and Cold Rolled Strip . . . Hot and Cold Rolled Sheets . . . Galvanized Sheets . . . Long Terne Sheets . . . WEIRITE Cold Reduced Tin Plate . . . Terne Plate —Special Coated and Roofing Ternes . . . Tin Mill Black Plate . . . Lacquered Tin Plate and Black Plate.

WEIRTON STEEL COMPANY—WEIRTON, WEST VIRGINIA

Sales Offices in Principal Cities

division of NATIONAL STEEL

NATIONAL STEEL CORPORATION

Executive Offices, Pittsburgh, Pa.

AN OPEN LETTER

To Furnace Dealers Generally, and
To WEIR-MEYER Dealers Particularly:

Today we are all faced with questions that would have been laughable even a year ago—but that are far from funny now—so we are setting these facts before you:

No. 1 is, of course, related to National Defense:
We are naturally proud that our Company and its products are an increasingly important part of this gigantic job. Our men and our machinery are daily providing the assurance that thousands and thousands of men in camp will be more comfortable and healthy next winter because their barracks (and many other structures) will be heated and air-conditioned by WEIR-MEYER equipment. There is not room here to list all the camps.

No. 2 is a look ahead—and AT YOU:
It is senseless for any firm to become so involved in this war-boom that it fails to look ahead and plan to avoid a post-war catastrophe. We are happily helping National Defense today--but we remember that it was our day-to-day business thru the years that built this firm to where it COULD help the U. S. today! And long after this emergency is over, our normal day-to-day business will sustain many thousands of families thru the making, selling and installing of WEIR-MEYER equipment in American HOMES! So we assure you here and now that WEIR-MEYER dealers will get furnaces and air-conditioning equipment to sell and install this fall and winter—AND EVERY UNIT SHIPPED WILL BE OF OUR TIME-TESTED QUALITY.

No. 3 looks BACKWARD—and AHEAD:
Each August ticks off another year for WEIR. On the market since 1882, this August starts WEIR'S 60th year. Many 25-year-olds and not a few 40-to-50-year-olds (and some of the first ones built!) are "still on the job and going strong." And WEIR'S are better-built today than then. When the day comes that we know how to build them still better (and our constant research should hurry that day!) we will do just that!

Very truly yours,

THE MEYER FURNACE COMPANY, PEORIA, ILLINOIS

N.B.—If the above impresses you as indicating "your kind of folks," we'd be happy to tell you more of our ideas and plans.

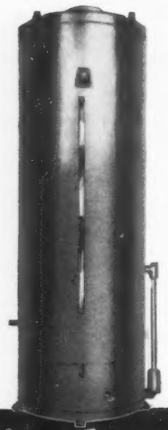
Lochinvar

Oil-fired FURNACES

FAMOUS from COAST TO COAST

BREMERTON, WASH.

LONG ISLAND, N. Y.



LOCHINVAR Oil-Fired Furnaces are accepted and used by leading builders and heating contractors wherever quality at low cost is demanded. Five sizes from which to choose, ranging from 115,000 to 50,000 b.t.u. at the bonnet. Also three gravity models—100,000, 70,000 and 45,000 b.t.u. at the bonnet. Every model priced to fit low cost requirements and built to give years of lasting service.

LOCHINVAR PRODUCTS

DIVISION OF MICHIGAN TANK & FURNACE CORP.

14247 Tireman Ave., Dearborn, Mich.

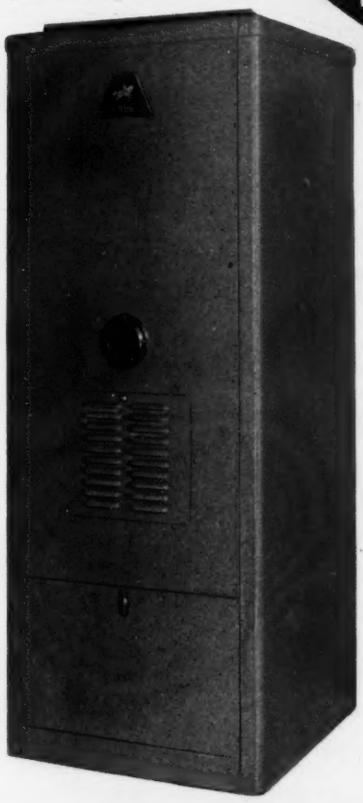
Also America's Fastest Selling Oil Burning Water Heater

and now

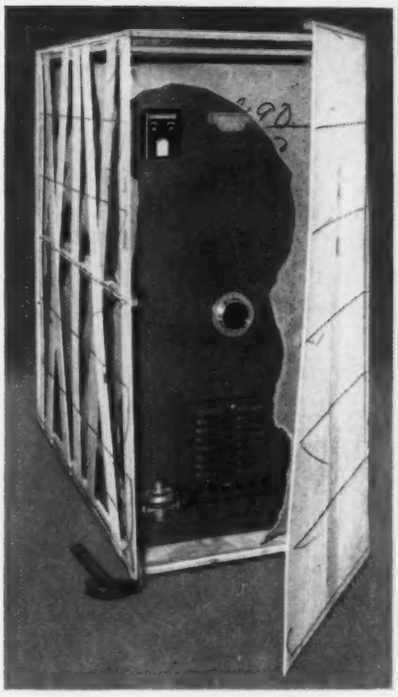
Lochinvar

Gas fired FURNACES

Model LGH-65
(Not factory assembled)



Models
LG-90, LG-80, LG-63
(Completely assembled)



Give Dealers

a complete line of winter air conditioning units for small homes. Lochinvar Gas Fired Units are approved by American Gas Association Laboratories and are designed especially for gas burning, incorporating many, new structural features for economy and long life. Three gas burning package units are completely assembled at our factory, ready for installation. The Hi-Boy unit is for utility room or basement.

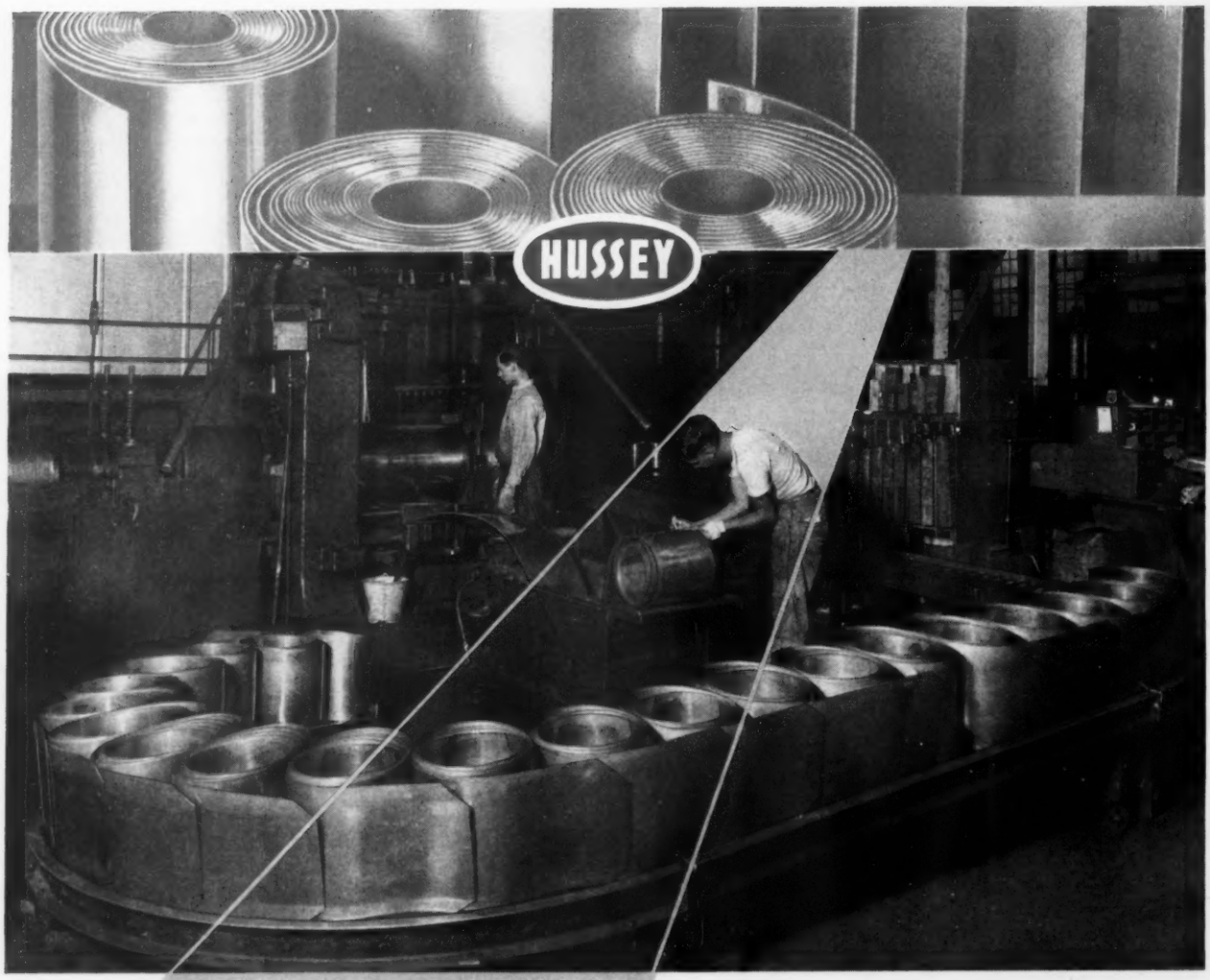
B.T.U. Capacities at Bonnet

Model LG-90	106,000
Model LG-80	88,000
Model LG-63	69,000
Model LGH-65	70,000

LOCHINVAR PRODUCTS

DIVISION OF MICHIGAN TANK & FURNACE CORP.

14247 Tireman Ave., Dearborn, Mich.



"KEEN EYES" SERVE YOU...

PROBING EVERY STEP IN THE MANUFACTURE OF HUSSEY COPPER

Protecting your interests are the keen eyes of inspection throughout every manufacturing process in the making of Hussey Copper. Strict purity control, hundreds of visual inspections and high precision gauging keep constant check on quality and accuracy—so that you will have trouble-free operations when you use Hussey Copper.

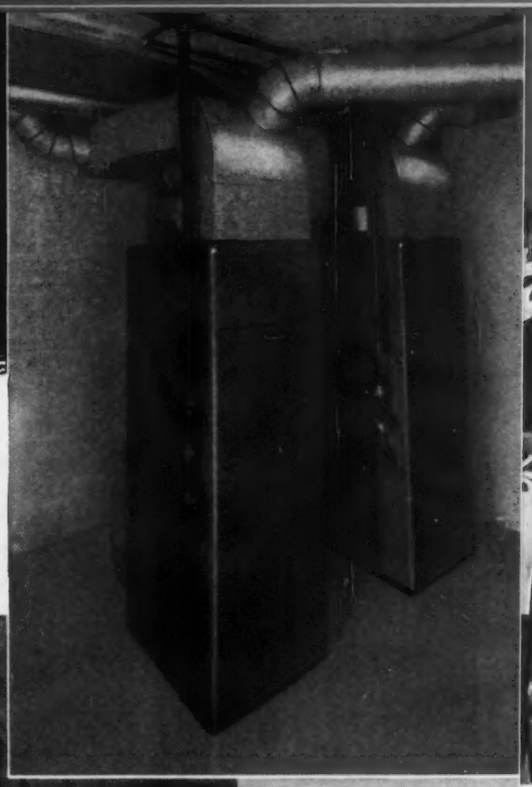
Hussey Copper costs you no more—why not have this added protection working for you? There is a complete Hussey Warehouse Stock near you ready to serve your copper needs promptly.

HUSSEY COPPER AND BRASS PRODUCTS

- Sheets
- Coils
- Bars
- Rolled Shapes
- Extruded Shapes
- Pipe
- Tubing
- Tubes
- Wire
- Nails
- Roof Drainage Supplies
- Fabricated Specialties

C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
Rolling Mills and General Offices: PITTSBURGH, PA.
WAREHOUSES IN PRINCIPAL CITIES

"More JANITROL Automatic Heat in Cincinnati than all other types of gas heat combined" says The Leading Heating Contractor



Individual heating systems for each separate apartment are used by hundreds in large housing projects. At right is a typical pair of Gerdsen's apartment installations.

Below: The Gerdsen's service truck supplements their superior installation and equipment.

The A. H. Gerdsen Co., Janitrol dealers in Cincinnati, merchandise the fact that Gerdsen's 11 years in business plus 35 years of Surface Combustion Experience in building gas equipment is a combination that assures heating comfort and complete satisfaction.

How well this has worked out both for the Gerdsen Company and the home owner is evidenced by dozens of voluntary testimonials Gerdsens receive from their customers.

"Heating bills lower than you estimate," says one, "Not a minute's janitor work nor any trouble," says another, "Our heat is uniform and comfortable with no furnace dust or dirt," says a suburbanite, "We have had less colds" is a further comment.

Working with the builder from the time the foundation is started until the installation is completed, Gerdsen engineers install duct work and grille and register locations as the work progresses. Hundreds of systems installed in cooperation with a large number of Cincinnati's architects and builders have formed the basis of Gerdsen's rapidly growing business.

Proud as they are of high quality engineering, duct work and installation, Gerdsens still say, "Good work only achieves its best results when heating equipment is worthy of the best workmanship." That is why Gerdsens, like leading dealers in Detroit, Hartford, Dayton, Huntington and other cities, have built such substantial businesses with Janitrol equipment.

The Janitrol line includes gas-fired gravity systems, forced air conditioners, conversion burners and unit heaters. Thus, Janitrol dealers are equipped to heat the smallest home, the neighborhood store, or the largest factory. Janitrol offers through its dealers a specialized service to the builder that gets the business.

Write or wire for dealer franchise information.

SURFACE COMBUSTION CORPORATION, TOLEDO, OHIO

Offices and Engineering Service in Principal Cities

Above: One of Cincinnati's larger homes heated and air conditioned with a Gerdsen Janitrol system.

At left: A Gerdsen heated home of the type ideally suited to Janitrol Forced Air Conditioning.

Below: Another of the hundreds of fine homes Gerdsen heated with a Janitrol Gas Fired installation.

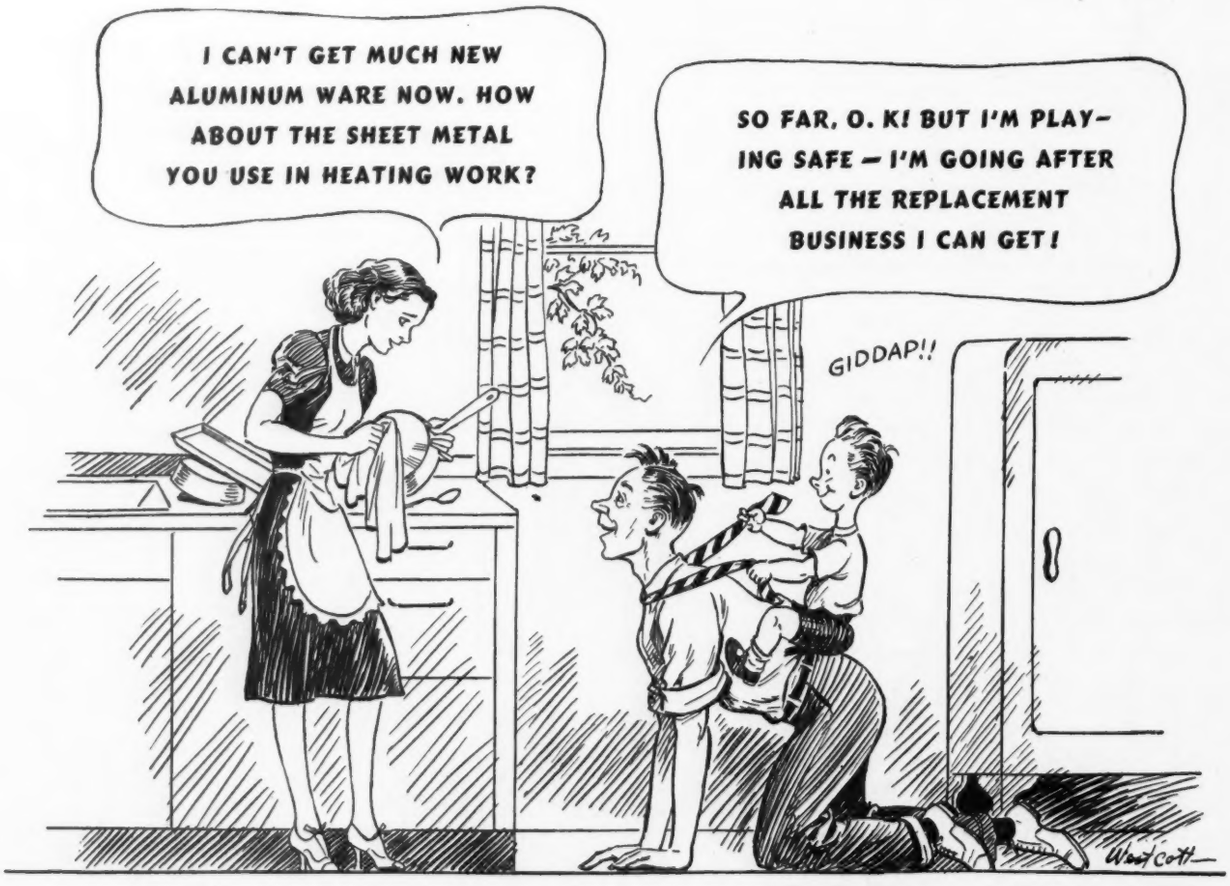
JANITROL

SC

WINTER AIR CONDITIONERS • CONVERSION BURNERS • UNIT HEATERS • GRAVITY FURNACES

Figurin' the Angles

What smart men do in these times to make money with Fiberglas* Dust-Stop* Air Filters


I CAN'T GET MUCH NEW ALUMINUM WARE NOW. HOW ABOUT THE SHEET METAL YOU USE IN HEATING WORK?
SO FAR, O. K! BUT I'M PLAYING SAFE — I'M GOING AFTER ALL THE REPLACEMENT BUSINESS I CAN GET!
GIDDAP!!
Westcott

Use Dust-Stop's Free Sales Plan To Roll 'em In!

IN 1941 you must be prepared for *every* emergency!

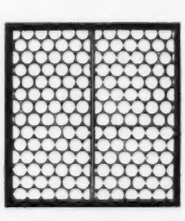
Take the metal trades, for instance. Defense work may cause certain shortages for private business. So right now's the time to boost your furnace-cleaning, repairing, and filter-replacement lines. They offer you the chance to make some real money! And in areas threatened by a fuel shortage, they help you save your customers the suggested 10 per cent on fuel.

How do you go about building up these lines? Dust-Stop's free sales plan is the answer to that one!

This is what you get! Free newspaper mats, postcards . . . mailing pieces . . . reminder labels . . . radio scripts! And your name and address will be imprinted on each of them . . . free!

That's not all! National advertising will work for you, too! Dust-Stops advertise in American Home, Better Homes and Gardens, Life, and Saturday Evening Post, informing householders about their filters, telling them how frequently they ought to change them, why they should select *Dust-Stops*, and where to get them (from you, of course!)

How about the profit? There's a good one on every single sale! It amounts to about $1.50 to $2.00 per furnace, per year. Apply these figures to 200 or 300 furnaces, and you'll see where some real money lies!



And here's something else you can get with Dust-Stops. They make it easy for you to contact more prospects . . . clear the way for other profitable jobs. Like a furnace-cleaning job, or money-making work adjusting the automatic firing unit or oil burner—all essential to economical furnace operation.

So why don't you take this proved way to set your filter-replacement business climbing? Write in *today* for Dust-Stop's free sales plan. Tell your manufacturer or jobber to send it to you . . . at once!

• • •

Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.

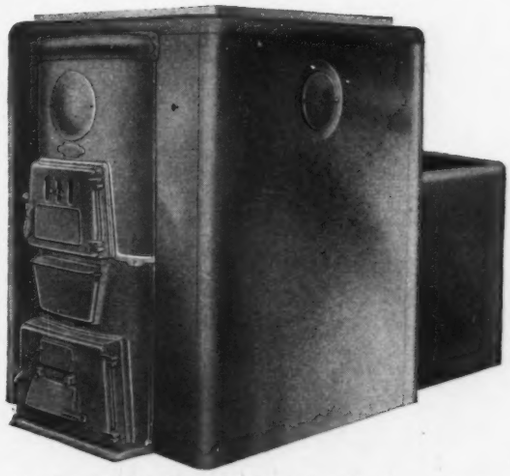
FIBERGLAS* DUSTOP* AIR FILTERS

T.M. Reg. U.S. Pat. Off.

Come and Get 'em!

LARGE INVENTORY BUILT UP IN ANTICIPATION OF DEMAND

Looking forward to a possible shortage of materials and finished heating equipment, we have built up a stock of Warm Air Furnaces which are now available to responsible dealers. If you need furnaces now, or anticipate a need for them later, we suggest that you write us at once.



The Royal Air Conditioning Heater is a modern streamlined unit combining economy, beauty and efficiency in an attractive green enamel steel jacket.

The ROYAL 900 Series is a sturdy, well designed and popular Warm Air Heater. A size for every home. Made for regular pipe and pipeless systems.

ONE OF THE LARGEST AND OLDEST FURNACE PRODUCERS

The Hart & Crouse Corporation is over 100 years old and is one of the largest, as well as one of the oldest, manufacturers of heating equipment. With a normal capacity to produce 25,000 furnaces a year, we are in a position to supply hundreds of dealers with their furnace requirements this Fall. And that's why we say "Come and Get 'em!"

A COMPLETE LINE

The Hart & Crouse Corporation offers a full modern line of Warm Air Furnaces and Air Conditioning Units for residential heating, including the 900 Series which is a truly competitive line. Modern assembly line methods assure expert workmanship at low cost of operation. The name Royal on heating equipment signifies fine quality.

The LIFETIME Warm Air Furnace—fully guaranteed for 20 years—is larger and carries higher ratings, per pot size. It is a deluxe model, cast in "Lifetime" alloy material.

HART & CROUSE
CORPORATION

301 TURNER STREET — UTICA, NEW YORK

FOR REAL *Quality and Performance* GIVE ME *Luxaire*

WITH Defense housing swinging to new highs, unlimited, profitable opportunities are greater than ever in the warm air heating field.

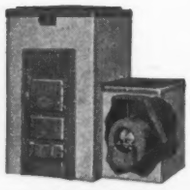
The Series 700 Luxaire gravity furnace with its permanently leakproof, riveted and welded steel heating element, duplex grates with cast rollers, operated by a substantial connecting rod with convenient upright shaker handle, streamlined front castings, machined and fitted—and many other engineering features in furnace design is encased in an all steel cabinet, attractively finished in two-tone green hammerloid enamel.

This efficient, economical, fast selling furnace gives you the opportunity to cash in with profits for you and your customer in this vast housing program.

SERIES 700

Available in Four Sizes

Enameled Cabinet Cold Air Shoes as illustrated, furnished at small additional cost.



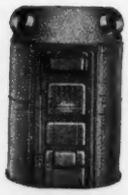
SERIES AC 700
Coal Burning Hand Fired Air Conditioning Unit, available in Stoker models.

SERIES A
Gas Fired Air Conditioning Unit. Quality—Comfort—Economy.

SERIES H
Gas Fired Utility Air Conditioning Unit — where space is important.

SERIES G
Gas Fired Gravity Unit—Economy for the small home.

SERIES 8000
Oil Burning Air Conditioning Unit. Compact—Efficient.



SERIES 600
Coal Burning Hand Fired Gravity Furnace. A leader in its field.

THE C. A. OLSEN MANUFACTURING COMPANY, ELYRIA, O.

INDEPENDENT
BASEBOARD REGISTERS
with Bendable Fins

Back view of section of register showing rubber gasket which seals the register to the wall.

No. 91—One-Piece Grille Not Removable

Styled in the Modern Mode

Always Leading... Always Progressing

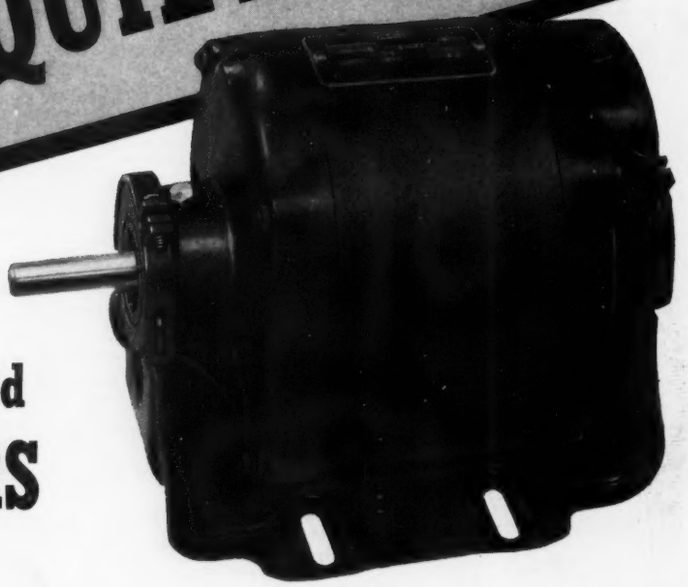
● The simple harmonious lines express all that is best in modern styling and adapt the register to any type of interior. Fins are set to deflect air flow slightly upward, but can be easily bent to direct air flow straight outward or downward, as required. This highly efficient register affords large open area with minimum resistance to air flow. Available also in two-piece style with removable grille.

Send for Catalog 41-G

THE INDEPENDENT REGISTER CO.

3747 EAST 93RD STREET, CLEVELAND, OHIO

A LONG LIFE.. AND A QUIET ONE



Dynamically Balanced DELCO MOTORS for Appliances

Delco motors for oil burners, blowers, compressor units, stokers and ventilating fans have introduced new standards of quiet operation in home and commercial installations.

Less vibration noise is transmitted through ducts and walls, because there is *less vibration in the motors themselves.* All Delco motors are dynamically balanced on an accurate machine developed by Delco Products and General Motors research facilities.

As a further assurance of quiet running, Delco motors are characterized by precision-machining of shaft and bearing surfaces—generous use of materials in frame—Delco resilient-base mounting—and the Delco End-Play Take-up Device for V-belt drives. The Delco Centrifugal Switch provides quiet, snap-action starting as well.

Delco motors are built by the most modern manufacturing methods, to give long life and exceptional dependability. They are thoroughly protected against damage from overload and overheating by the Delco Thermotron, listed by underwriters.

Consult the Delco Products Engineering Department for specific recommendations.

DELCO MOTORS

DIVISION OF GENERAL DELCO PRODUCTS DAYTON, OHIO MOTORS CORPORATION

CHRYSLER AIRTEMP DEALERS MAKE MONEY

Chris Meyer, At Indianapolis, Has Developed A Profitable *year-'round* Business

CHRIS MEYER, President of Indiana Tempered Air, Inc.—Airtemp dealer in Indianapolis—is doing a splendid 12-month-a-year volume by taking full advantage of the complete Airtemp line of *both* heating and cooling units.

Indianapolis is a hot spot in summer and Meyer is letting the prosperous Hoosiers know they can have year-'round air conditioning—in their homes as well as in their offices and places of business. Indiana Tempered Air, Inc., has made 40 complete installations of combination heating and cooling units in Indiana homes—this in addition to a substantial number of Airtemp winter air-conditioning furnaces and a fine volume of replacement business.

Mr. Meyer has sold more than two hundred and sixty 3 h. p. and 5 h. p. cooling units to stores, restaurants and offices in the last year! He does a profitable volume, too, on the larger central summer air-conditioning installations. Read what Mr. Meyer has to say about his success in building a *year-'round* business with the Chrysler Airtemp line!

C. P. Meyer, President, Indiana Tempered Air Inc., Indianapolis, Ind., concentrates his merchandising and selling talents entirely on Airtemp products. He has built a profitable business.

CHRIS MEYER SAYS—

"An air-conditioning dealer can make money only if he concentrates his efforts on the sale of one nationally-accepted line—made by a factory that knows how to design and manufacture equipment that looks well, sells at the right price, gives complete satisfaction and stands up with a minimum of service. I am pleased over my decision to handle only Chrysler products. From Airtemp I can get any type of equipment required in my territory—including summer air conditioning which gives me a year-around volume. And I know that I am not going to have any trouble after installation."

At the left is the building occupied by Indiana Tempered Air, Inc., Indianapolis Airtemp dealer. Here complete service facilities and a handsome salesroom display help Meyer's organization build profitable sales volume.

MAIL THIS CARD FOR THE AIRTEMP PROPOSITION!

AIRTEMP DIVISION, DEPT. AA-8
Chrysler Corporation, Dayton, Ohio

GENTLEMEN:

Please send me complete information on your Chrysler Airtemp money-making Proposition for dealers.

Name _____

Address _____

City _____ State _____

CHRYSLER AIRTEMP

What you get as an Airtemp Dealer

Remember that the success of Chrysler Corporation is based on the success of more than 10,000 dealers. In the Airtemp Proposition every factor for dealer success has been provided. (1) A complete line. (2) Competitive prices. (3) Adequate gross profits. (4) Factory cooperation. (5) A nation-wide reputation and acceptance.

Air-Conditioning Furnaces

The Airtemp line of air-conditioning furnaces includes oil-, gas-, and coal-fired units from 70,000 to 200,000 B. T. U. output—Chrysler engineered, Chrysler warranted. Prices to meet every building or replacement budget. All are up to the minute in engineering, design, finish and eye-appeal.

"Packaged" Cooling Units

Sales of Airtemp "packaged" cooling units have increased 300% in a year! Equipped with the exclusive Airtemp hermetically-sealed radial compressor, this unit undersells competition, provides the most efficient, low-cost summer cooling available. Airtemp also makes radial compressors for central installations—from 10 to 75 h. p. Cooling sales are a bonanza for smart heating dealers.

Percolator Boilers

Airtemp builds a complete line of boilers for automatic heating—oil- or gas-fired—for every home requirement. The new percolator design has greatly increased efficiency and heating speed, decreasing size of boiler for each job. Percolator action is strong selling point. Low price appeals to prospects.

Gravity Furnaces

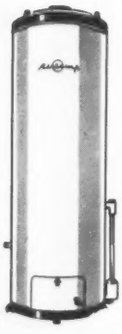
Many dealers want a line of modern-engineered, low-cost, gravity furnaces. Airtemp gravity furnaces, either steel or cast-iron, represent the best values on the market—provide real heating efficiency and long life with any standard fuel.

Oil Burners

The Airtemp Twin Airflow oil burner is the first real advance in oil-burner design in 11 years! This exclusive burner is a definite sales asset as it saves the buyer money—cuts oil bills. Other Chrysler-engineered, precision-built burners for every requirement down to ¾ of a gallon of oil per hour.

Year-'Round Air Conditioning

Chrysler Airtemp offers dealers the only practical, low-cost, heating and cooling unit on the market. Here is year-around air conditioning even for homes of modest cost—a sales leader that proves the modern engineering and design of the Airtemp line. Yes, as an Airtemp dealer you get a *complete* line—with which you can build *year-'round* volume—



Water Heaters

The Airtemp automatic, vaporizing, oil-burning water heaters are a fast selling line. Competitively priced, they have many exclusive features. With 7¢ fuel oil, your customers can get plenty of hot water for 3¢ a day. Finished in white enamel, fully insulated. Underwriters' Laboratories approved.

+ CHRYSLER ENGINEERING
+ COMPETITIVE PRICES
+ POWERFUL SALES AIDS

Postage Will Be Paid by Addressee

BUSINESS REPLY CARD
First Class Permit No. 885, Sec. 510, P. L. & R., Dayton, Ohio

No Postage Stamp Necessary If Mailed in the United States

AIRTEMP DIVISION, Dept. AA-8

Chrysler Corporation

DAYTON, OHIO

Tear Out and Mail This Card—NOW! Get The Facts!

CHRYSLER AIRTEMP

AIRTEMP DIVISION OF CHRYSLER CORPORATION • DAYTON, OHIO

Comfortable Users Said: Don't Change the Penn Temtrol

But Installers Suggested the Time Saving Improvements in this New Thermostat

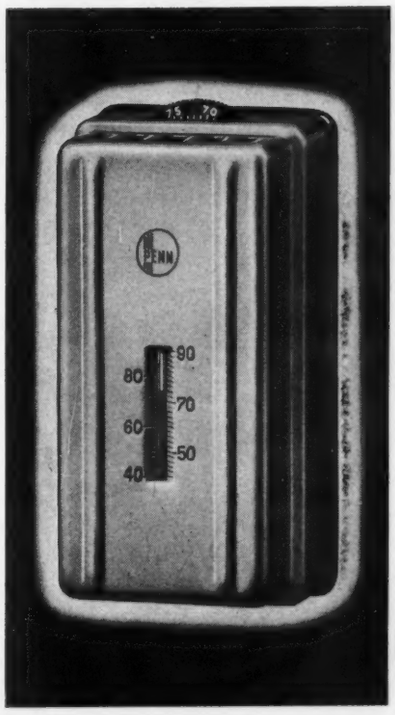
SIX years ago, Temtrol, Penn's heat anticipating or internally heat actuated thermostat, was announced. It was the first practical thermostat of its kind—first to give "fraction-of-a-degree" temperature control on all types of heating systems—steam, hot water or warm air.

Such accurate temperature control *then* was almost unbelievable. *Now*, it is an accepted fact. Today, thousands upon thousands of home owners are better satisfied with their automatic heating installations because they are controlled by Temtrol. Comfortable users and laboratory workers alike have said for years, "How can anyone make a better thermostat?"

The truth of the matter is, neither Penn nor any other thermostat maker has been able to improve on the temperature controlling, constant comfort qualities of Temtrol. But from those men "on the firing line," installing and servicing automatic heating equipment, have come suggestions for refinements in design and construction to make the installer's work easier . . . to save installation time.

New 870 Series Temtrols Offer these Refinements

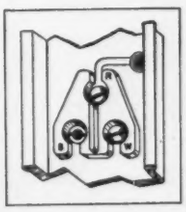
Here, Mr. Installation Man, is the *new* Penn Temtrol, built to your specifications. A modern, easily installed, non-breakable metal cover. A one-piece molded bakelite base with quick three-point mounting . . . reduces the problem of base distortion. Combination wire stop and terminal barriers molded into back of base to speed up wiring . . . prevent stray wire strands from causing a future service call. A simple, plainly marked differential adjuster—Cycle-ator—to provide accurate control for all systems. Specify Temtrol. Install Temtrol. See these new advantages for yourself.



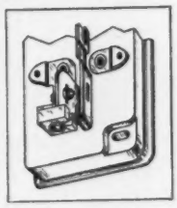
Day-Nite Control, Too

And, the new 870 Series Temtrols, offer the simple, two-wire automatic Day-Nite Control with Tem-Clock that has proved so popular with manufacturers, dealers and installers. You can still stock Standard Temtrols, keep a few inexpensive Day-Nite heaters and Tem-Clocks, and provide your customers with fully automatic, all-electric Day-Nite Control "on order" with a limited inventory. Easily installed, and the customer can have Tem-Clock in any room he chooses, regardless of where the thermostat is located. Write for complete information on the new Penn Temtrols.

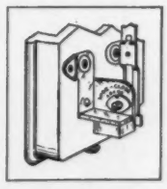
Penn Electric Switch Co., Goshen, Indiana. In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont. Export: 100 Varick St., New York City. Representatives and distributors in all principal cities.



Temtrol temperature controlling qualities couldn't be improved, but the installer's work has been made easier in the new 870 Series Temtrols. Here is a partial back view of the molded bakelite base, showing terminals recessed into the base, which forms both wire stops and terminal barriers to save wiring time and prevent stray strands of wire from contacting each other.



This entirely new snap-acting magnet contact structure offers these advantages: Alnico magnet, the strongest, most permanent magnet yet devised. Contacts which both *open* and *close* with armature moving at full speed. Contacts and flexible contact leaf well protected against accidental damage.



Cycle-ator, a convenient, plainly marked differential adjuster, provides a full range of adjustment to meet all installation conditions . . . for all types of heating systems — steam, gravity hot water, forced hot water, gravity warm air, forced warm air—gas, oil or coal fired. Assures maximum comfort with minimum fuel consumption.

Day-Nite Heaters for 870 Series Temtrols are available for 6°, 9° or 15° night set-back of temperature. Easily installed in the field on Standard Temtrol. Day-Nite Temtrols regularly supplied with 9° set-back heater unless otherwise specified.

Comfort Zone Control Means Satisfied Customers

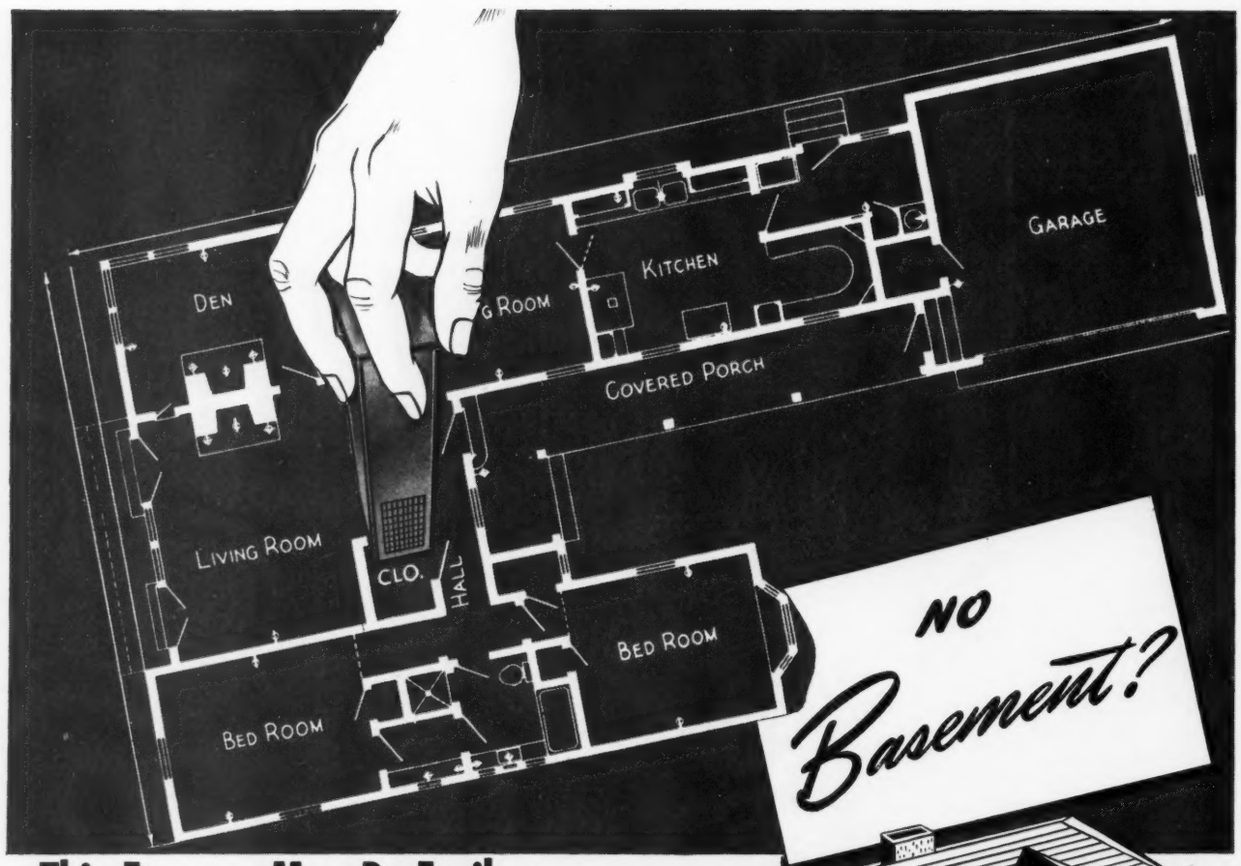
The occupied half of the home—the Four Foot Zone—is the *Comfort Zone*, with the heating plant controlled by Temtrol, mounted at table level. Eliminates "Cold 70" . . . gets rid of cold floor problems . . . automatically compensates for outside temperature changes with a simple, standard control system.

More information on what Penn Controls will do for you — One of a Series.

PENN

Penn-Built Controls for Many Applications

Thermostats, Bonnet Controls, Ductstats, Fire Protection Controls, Water Temperature Controls, Boiler Pressure Controls, Boiler Water Level Controls, Humidistats, Stack Switches, Stoker Timer Relays, Solenoid Gas Valves, General Purpose Relays, Solenoid Refrigerant and Water Valves, Refrigeration Pressure and Temperature Controls, Water Valves, Pump Controls, Air Compressor Controls, Air Volume Controls, Line Starters.



This Furnace May Be Easily Installed in Closet or on Service Porch

Here's another PACIFIC feature you and your customers will appreciate! Because it is so compactly designed, this dual-purpose unit can be installed in closet, hall or service porch without altering floor plans.

●

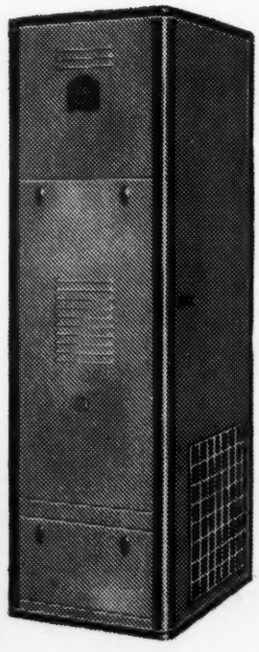
Though it occupies minimum floor space and requires no basement, the PACIFIC A-11 represents the "last word" in modern gas-fired furnace design. In winter, it automatically circulates luxuriously warm filtered air throughout the home. In summer, it supplies refreshing ventilation. Winter *and* summer, it assures the exceptionally efficient, care-free, automatic operation that helps you close sales quickly and profitably.

There's a complete line of A.G.A. approved PACIFIC gas-heating appliances for every need. *All* of them embody the sales stimulating *extra values* that 28 years of specialized experience have created.

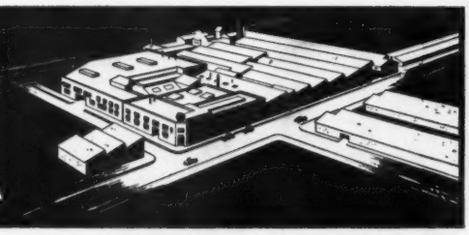
Investigate the profit possibilities of the PACIFIC line today! You'll like the units themselves and you'll approve of the profitable PACIFIC dealer set-up. Address Dept. AA-841.

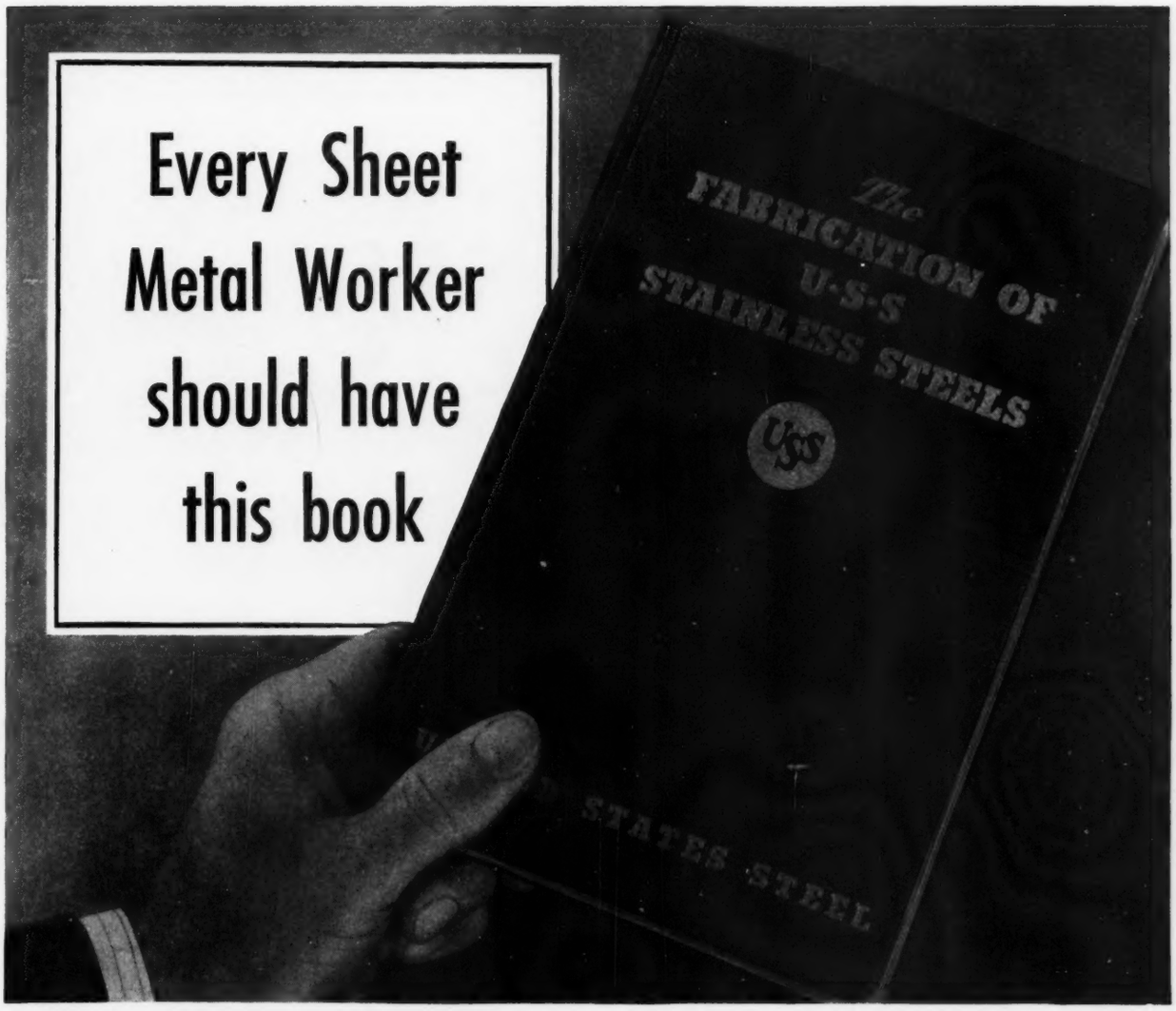
DELUXE FORCED-AIR UNIT

Model A-11 is an exceptionally compact, self-contained, complete heating and ventilating unit, especially designed for installation in homes without basements. Embodies all the latest features of PACIFIC design and built for years of care-free service. Easy to install. Shipped completely assembled, ready for installation. A good profit-builder.



Pacific
GAS RADIATOR CO.
HUNTINGTON PARK • CALIFORNIA





It is yours for the asking . . . a handsome leatherette-bound book giving complete information about the fabrication of U·S·S Stainless Steels.

It discusses the types of U·S·S Stainless Steel, welding, riveting, soldering, joint design, machining, cutting, forming, annealing, pickling, and surface finishing.

This book is not an ordinary piece of advertising but rather a complete instruction book on better methods of working U·S·S Stainless Steel. It will save you time and money.

There is no charge. Just attach this coupon to your regular letterhead. We are glad to furnish the book to any sheet metal worker who can make good use of it.

★ ★ ★ ★ ★ **Because of the importance of U·S·S Stainless Steels in the National Defense Program, temporary delays in providing for normal peacetime requirements are unavoidable. We believe we can count on your understanding cooperation. Production facilities are being rapidly increased and inevitably we shall win this race against time and National need. U·S·S Stainless Steel will then be more plentiful than ever before.** ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

U·S·S STAINLESS STEEL

USS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
Scully Steel Products Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

United States Steel Corporation Subsidiaries
Room 624 Carnegie Bldg., Pittsburgh, Pa.
Gentlemen:

Please send me your book, "The Fabrication of U·S·S Stainless Steels."

Name.....

Address.....

City.....State.....

NEW TIMES
NEW IDEAS

It takes more brains to make advertising and selling fit industry's needs now. Some men we know are doing it well. If you want to learn to use advertising more effectively, plan to swap ideas with other wide-awake men at the 1941 three day N. I. A. A. Conference in September at the Royal York Hotel, Toronto, Canada. A new setting, a thousand executives, and speakers of international reputation.

Make this note in your diary

19th ANNUAL N. I. A. A. CONFERENCE
TORONTO, CANADA • SEPTEMBER 17, 18, 19

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.
100 EAST OHIO STREET CHICAGO, ILLINOIS

WHERE TO, SOLDIER?

THEY gave him a pass today, for the week-end.

The world is his—at least as far as the nearest town. No more K.P., no more drill, no more formations till Monday. He can be John American, his own master, having a good time. That pass is his *open sesame.*

But is it?

Where will he and his buddies go in that town overrun with soldiers? Where will they eat and sleep? What can the community do to give them relaxation and entertainment?

• • •

One of the forgotten problems in any high-speed scheme of national defense is how to provide for the soldier and sailor off duty.

Within the camps and naval stations the services themselves have excellent facilities. But in the surrounding cities and towns the problem is acute and difficult.

Many of the newer army camps are located far from the larger centers. Into towns of 1,000 to 5,000 population may come as many as 3,000 men on a single evening. Where are they to go? How is the community to provide for them, to see that they get the wholesome food and entertainment that all of us would like them to have?

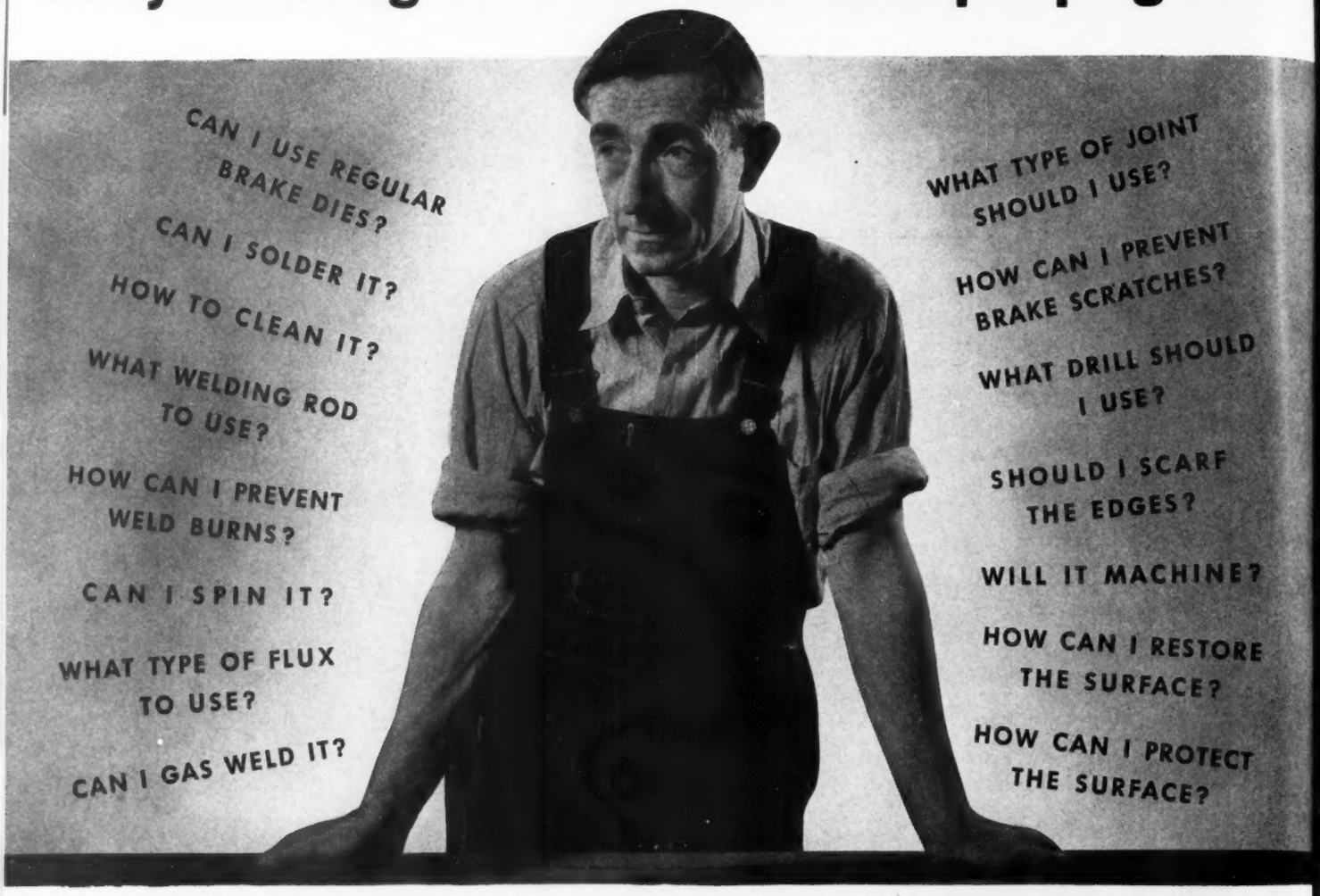
To meet this emergency all the "service agencies" of the last war have joined forces. The Y. M. C. A., the National Catholic Community Service, the Salvation Army, the Y. W. C. A., the Jewish Welfare Board and the National Travelers Aid Association have combined to form the United Service Organizations—known as the U. S. O. Differences of race and creed have been forgotten; lesser distinctions have been subordinated to the idea of united service.

How can you help? The U. S. O. is raising approximately eleven million dollars to finance its program of leisure-time aid to the men in service. This is your opportunity to do your bit for national defense. Give generously to the U. S. O.

How will the money be used? In maintaining 360 U. S. O. clubs. The government is building the club houses themselves. What is required now is money to operate them.

How and where shall you give? To the local committee that has charge of your city's part in this national drive. No matter how much or how little you feel you can give, send it today to your local chairman or to National U. S. O. Headquarters, Empire State Building, New York.

Are you looking for a stainless steel quiz program?


CAN I USE REGULAR BRAKE DIES?
CAN I SOLDER IT?
HOW TO CLEAN IT?
WHAT WELDING ROD TO USE?
HOW CAN I PREVENT WELD BURNS?
CAN I SPIN IT?
WHAT TYPE OF FLUX TO USE?
CAN I GAS WELD IT?
WHAT TYPE OF JOINT SHOULD I USE?
HOW CAN I PREVENT BRAKE SCRATCHES?
WHAT DRILL SHOULD I USE?
SHOULD I SCARF THE EDGES?
WILL IT MACHINE?
HOW CAN I RESTORE THE SURFACE?
HOW CAN I PROTECT THE SURFACE?

? Have you ever wished for a "quiz program" to give you all the answers about fabricating or welding stainless steel? Are you faced with the necessity of changing from a chromium-nickel analysis to a straight chromium type? Are you worried about differences in fabrication or welding—and if changes in practice may be required in your shop?

Let's banish those worries now—once and for all!

Here are two Republic booklets to answer all those perplexing questions. They'll change your frown to a smile. They'll tell you all you want to know about working Republic ENDURO* Stainless Steel. And more, they'll tell you about short-cuts and tricks of working that will help you produce better work at lower cost—and, consequently, at greater profit.

We've distributed thousands of these books to stainless fabricators who have used them to good advantage. We have a copy of each book ready to mail to you. Why not write us now and get a free education on the working of Republic ENDURO Stainless Steel. It's a handy and profitable thing for every sheet metal man to have.

For information on the fabrication of stainless steel, ask for Booklet 322-A—for welding data, ask for Booklet 373-A. We'll send both if you want them.

REPUBLIC STEEL CORPORATION

Alloy Steel Division: Massillon, Ohio • General Offices: Cleveland, Ohio

BERGER MANUFACTURING DIVISION • CULVERT DIVISION
NILES STEEL PRODUCTS DIVISION • STEEL AND TUBES DIVISION
UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

*Reg. U. S. Pat. Off.

REPUBLIC *Enduro* STAINLESS STEEL

SHEETS—STRIP—PLATES—BARS—RODS—WIRE—TUBING—BOLTS—NUTS—RIVETS

Vol. 110 American Artisan No. 8

As We See The Picture

IF ever there was a time for calm, analytical consideration of the problems confronting business—that time is right now.

For months our industry—and scores of other industries—has been laboring under a cloud of uncertainty, gossip, "scare" headlines, "inside" dope and word of mouth rumor.

We have become confused under the impact of ideas so radical, so far apart from our customary thinking, that we cannot analyse. We have become so weary that we are content to drift with the tide hoping that some how, some time, this confusing cloud will break apart and there will be American business as it used to be.

There is serious need among all business men for courage, calmness, scrutiny, patience. Above all, a need for reasoned analysis.

We should, by now, realize that news competition is making it necessary for the reporter or commentator to play up the "attention value" of sentences, or phrases which, standing alone, are startling, but which, fitted into the jig-saw which is business in 1941, become only commonplace.

We must always keep in mind that under the pressure of our gigantic preparedness program many men must necessarily say many things. We must remember that no one man in America today speaks finally—that each man's thinking must be tempered by the thinking and decisions of other men.

It is a complex procedure—a creaking, stumbling machine, but is, after all, democracy making progress.

We have heard there is to be no material left for furnaces, but we have heard, also, that rearmament workers can't live in tents, trailers, or shacks, and 625,000 houses are needed to shelter them. Even a fair-to-average percentage of this volume heated by warm air will constitute a "big" year.

FHA in this issue announces a tremendous drive this Fall to rehabilitate old houses on the theory that old houses made over become suitable quarters for medium and low wage earners. Surely, such rehabilitation will mean many new or remodeled heating plants. The potential volume in this drive is tremendous.

We have been told that new house construction will be restricted to defense areas only. But even a casual study of Arnold Kruckman's list of defense areas in this issue will show that these areas cover practically every active industrial area in the country and are the same areas which have been actively building in 1939 and 1940.

The sheet situation is a bit harder to analyze. No zinc for spelter, by itself, need not put us out of business. In the last war we had no galvanized sheets, yet we got along satisfactorily by paint finishing our sheets. We can do so again.

Some special materials like aluminum, stainless steel, alloys, perhaps even copper, may not be available unless for defense, but again it is difficult to believe that we can't find some way to keep busy even though it may not be completely satisfactory from the standpoint of ultimate service.

As we have stated editorially before, industry has never been able to get along without a comparable volume of construction. When business is booming, building booms; when business lags, building lags. Certainly today business is booming. Our national income is higher than any time since 1929. More people have money to spend and they will find ways to spend it despite governmental edict.

We, as an industry, can do this—Refuse to "go off the deep end" every time we open our newspaper or turn on the radio. Make the best of each situation as it confronts us. Determine to analyze and scrutinize calmly each and every statement which seems likely to influence our business, remembering that it takes many minds and many "bureaus" today to reach the final decision.

Furnace Industry's Call to Washington

Produced one definite conclusion—if the furnace industry wants materials everyone (dealer, jobber, manufacturer) must account for every pound of material used.

By George Boeddener
Managing Director, National Warm Air Heating & Air Conditioning Ass'n

PROBABLY by the time this article goes to press the Defense Housing Rating Plan will have been announced by the Defense Housing Coordinator's Office and the Priorities Division of the Office of Production Management. Defense housing areas will be designated. There will be an official definition of defense housing and defense areas. We understand the plan is designed to give priority ratings for defense housing construction.

Defense housing seems to include those houses in defense areas where the intended sales price does not exceed $6,000 and the intended rental does not exceed $50.00 per month. Rehabilitation of old properties in defense areas, we understand, will be included in the Defense Housing Rating Plan.

Leon Henderson, Administrator of Price Administration and Civilian Supply (OPACS) a few weeks ago announced that a number of consumers durable goods including furnaces would receive priorities for repair and maintenance before other civilian requirements would be taken care of. O.P.M. will carry out this ruling. To date O.P.M. have not had an opportunity to set up a department to carry out the ruling.

To cope with all the rules and regulations eminating from Washington, we believe that it is going to be necessary for each dealer, jobber and distributor to cooperate with the manufacturer of the products he purchases. Unless they do it is going to be impossible for manufacturers in our industry to replenish their stocks of raw materials.

By cooperating, we mean that it is necessary to account for almost every pound of material used in our industry. Never before have materials become so scarce and in some cases impossible to obtain.

We urge that each dealer keep a record covering all materials used for defense housing, repairs and replacements and other civilian requirements. Following is a suggested outline of what the records should include:

1. Name, street address, city, town and state of each installation.
2. Date material was purchased and from whom purchased.
3. State if material is for a Defense House or a Defense Housing Project. If for a defense housing project, give the project number. If the contractor or builder has been given a priority rating, give that too.
4. State if installation covers a replacement or repair. If for instance a new furnace replaces an old one give the exact or approximate age of the furnace replaced.
5. In connection with installations in old and new houses give the intended structure's sales or rental price.
6. Give your name and complete business address.
7. Show the size and kind of material used on each installation. For instance, on each contract you make your records should show the quantity of material used. If it is a furnace the manufacturer's number should suffice. The manufacturer can convert the number into pounds of material used. Registers might be designated by sizes. On prefabricated pipe and fittings you should keep a record of the dollar purchase price and, if possible, determine the total weight. All of the materials you purchase including furnaces, registers, pipe and fittings, filters, blowers, controls, humidifiers, etc., should be accounted for, covering each manufacturer's products.

Only through one hundred per cent cooperation on the part of each and every unit of the Warm Air Heating Industry can we expect to obtain materials for all essential requirements. I say expect. Why? Because there is no guarantee of any kind that we will secure sufficient materials for all essential and necessary services. But if we can account for the destination of the products of the industry we are in an infinitely better position to obtain what we need.

Some dealers, jobbers and distributors may resent keeping records as suggested. This is only natural because of the added amount of work. But please bear in mind that the manufacturer who serves you must furnish exhaustive records, based on your information, to the Priorities Division of O.P.M. Washington. The manufacturer must make an application covering each supplier of raw materials with whom he does business. One of the applications for a priority rating includes information covering a five page form. And then after the application for priority rating is presented, it can take weeks or months before it is granted, if it is granted at all. And if he does obtain a priority rating which he presents to his supplier of raw materials, he cannot be sure when his order will be shipped.

Materials for Defense Requirements come first. Then come the materials for maintenance and repair and finally those for civilian uses. There has not yet been sufficient clarification as it affects the warm air heating industry between repairs and maintenance and civilian supplies.

For the benefit of the community you serve, for your own benefit and the industry, we can, I am sure, better serve the Defense Program by keeping a record of the final destination of the products of the industry.

You will want to know about these

New Amendments to the National Housing Act

THROUGH legislation approved by President Roosevelt on June 28, 1941, Congress has enacted a new series of amendments to the National Housing Act extending various important phases of the Federal Housing Administration program which otherwise would have expired on July 1, 1941, and modifying a number of existing provisions of the Act in the interests of more effective execution of the FHA program.

The principal provisions of the new amendments affecting our industry are the following:

1. The authority of the Federal Housing Administrator to insure property improvement loans under Title I of the Act (modernization and repair), which would have expired on July 1, 1941, is extended for two years to July 1, 1943.

2. The maximum amount of any individual loan which may be insured under Title I is raised from $2,500 to $5,000 in the case of loans to finance modernization and improvement of residential structures designed or to be designed for more than one family, and from $2,500 to $3,000 with respect to loans to finance the construction of new structures. (Title I, Class 3). For modernization and improvement loans of more than $2,500, the maximum term is extended from three years and 32 days to five years and 32 days.

3. The new amendments authorize the President to increase by $1,000,000,000 the maximum principal amount of all mortgages insured under Title II of the Act which may be outstanding at any one time. The previous maximum authorization was $4,000,000,000, which thus may be increased by Presidential approval to $5,000,000,000.

4. The authority of the Administrator to insure mortgages on existing homes, which would have expired on July 1, 1941, is extended for three years to July 1, 1944. Furthermore, the previous provision limiting the aggregate amount of mortgage insurance involving existing homes to 25 per cent of the total amount of insurance authorized under Title II is amended by increasing that ratio to 35 per cent.

Title I Aids Home Maintenance

The amendments to the Act extending the authority to insure under Title I and broadening certain aspects of the Title I program were advocated by the FHA and supported in Congress as well justified by the demonstrated success of the program in supplying funds to property owners on reasonable terms to finance needed repairs and improvements. The program thereby has exercised an important function in checking deterioration and blight among existing homes, approximately one-third of which are between 25 and 50 years old.

Since the start of the FHA program, upwards of 3,200,000 loans exceeding $1,300,000,000 have been reported for insurance under Title I, of which less than 50 per cent are now outstanding. During the first five months of 1941, Title I loans reported for insurance amounted to $97,748,967, an increase of 15.2 per cent over the like period of 1940.

Of particular interest under the Title I program are the new provisions permitting loans of $2,500 to $5,000 for the improvement of residential structures designed or to be designed for more than one family and extending the maximum term of such loans to five years and 32 days. Studies have shown that the cost of converting large existing dwellings into two or more small apartments generally exceeds $2,500 and, on larger projects, may run as high as $5,000. Moreover, by extending the repayment period on loans of between $2,500 and $5,000 to five years from three years, the added monthly rental revenue produced by conversion can be expected in most cases to exceed the monthly payments required by the loan. With the demand for additional housing units increasing rapidly in many industrial centers as a result of the defense program, conversion operations represent a quick and economical method for supplying part of that demand.

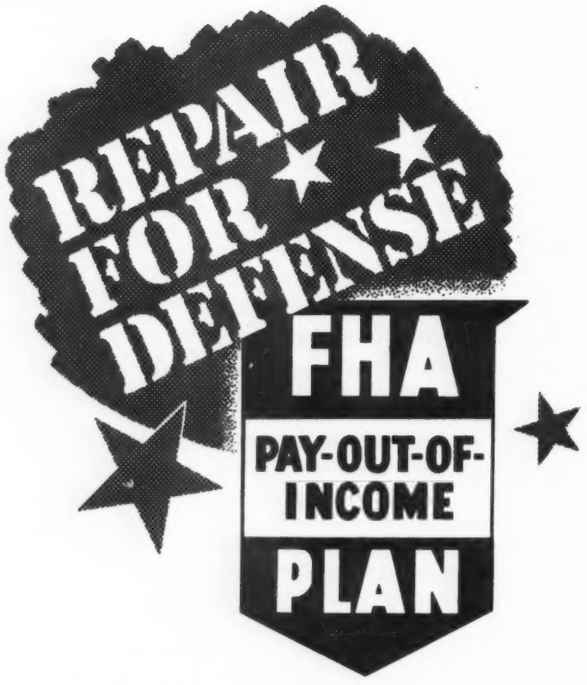
It is anticipated that small loans for the purpose of financing such improvements and repairs to individual homes as new roofing and siding, painting, or plumbing and heating installations will continue to make up the large majority of the transactions insured under Title I. The typically small size of the loans insured under the program is illustrated by the fact that the average amount of such loans in 1940 was $420 and that 50 per cent of the loans were for less than $287.

For loans of this character, the maximum term will be continued at the existing limit of three years and 32 days. The new amendments, however, permit the Administrator to consent to extensions or refinancing of all modernization and improvement loans upon such terms and conditions as he may prescribe, subject to certain limitations. Experience has shown that in many cases involving defaulted loans, the borrower could repay the loan in full if permitted some additional time beyond the maximum term, which in most instances the lending institution would be willing to grant.

Reason for Increased Amount

The increase in the maximum amount of Title I Class 3 loans was recommended on the basis of findings that present conditions involving the cost of labor and materials in many areas require a mortgage of approximately $3,000 to finance new small single-family homes. The increased amount will therefore improve the effectiveness of this alternative FHA method for financing new small homes in the lowest price ranges. The maximum term of 15 years and 5 months for Class 3 loans is retained in the regulations.

FHA's Fall Program for Rehabilitation



The emblem of the campaign in red, white, blue (FHA Form No. 280) is available as a window sticker, also in mat for advertising.

"REPAIR FOR DEFENSE," a theme stressing property preservation and the remodeling of homes in defense areas, will be the basic appeal of a new repair campaign sponsored this fall by the building industry, finanical institutions, and the Federal Housing Administration.

To convert old homes into defense housing and to prepare the "home front" for its job as the bulwark of America's defense, articles and advertisements in newspapers and magazines, announcements over radio stations, window and transportation posters, local demonstrations, booklets, and other means of public education are being made ready throughout the nation.

Envelope size folder (FHA Form No. 810) for direct mail, counter distribution, explains how to repair on the FHA plan.

Brand new provisions of FHA's property repair (Title I) plan will back up the new drive with proper financing facilities. Federal Housing Administrator Abner H. Ferguson, commenting on the 1941 program, said: "This effort of the building and allied industries to do the big job of housing workers in our defense industries finds the machinery already organized and running efficiently—thanks to seven years' experience in a nationwide program of encouraging constructive home improvements."

Will Make Old Buildings Rentable

The 1941 program, aimed exclusively at defense production areas, will encourage the conversion of old houses into multiple-family dwellings or rooming or boarding residences.

While the building industry is believed ready to construct as many new homes as required in such communities, it is realized that every available home already built should be utilized. Needed housing can be supplied quickly and economically from large well-located homes which are not being fully used. This is described as a sensible "short cut" to additional defense housing.

Organizers of the 1941 drive are also aware that there is no economy in allowing homes to go to pieces through neglect during the present period of emergency. The total value of homes in this country, it is estimated, is around 80 billion dollars. Even normal obsolescence amounts to about 2 billion dollars annu-

Window Display No. 6 for dealers consists of a streamer (68" by 16"), vertical side pieces (60" by 16") and poster (28" by 28").

ally. With one-third of the homes in the United States between 25 and 50 years old, the wisdom of "a stitch in time" is obvious.

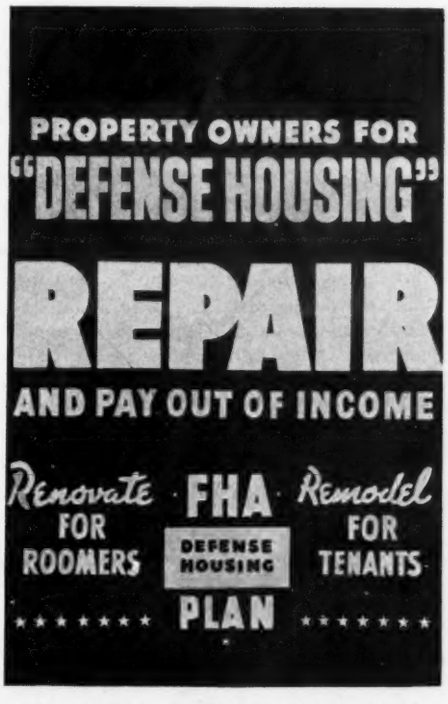
Building construction leaders and FHA officials point out that the housing industry is one business which the present crisis finds prepared for effective national action. National emergencies and programs are nothing new to the home building business, which in 1934 was faced with starting an almost paralyzed industry on the job of doing billions of dollars in home repairs and new construction. Its success in organizing a national program to surmount that problem makes the building industry confident it can house defense workers and maintain America's housing equipment in adequate condition and quantity during the present emergency.

The new program will make strong use of the slogan "Defense calls for Home Repairs." Builders, contractors, financial institutions, material manufacturers, dealers, and others can cooperate to spread this theme from coast to coast through national and local advertising. The entire program is modeled after previous successful campaigns by the building and allied industries.

"Helps" to Be Available

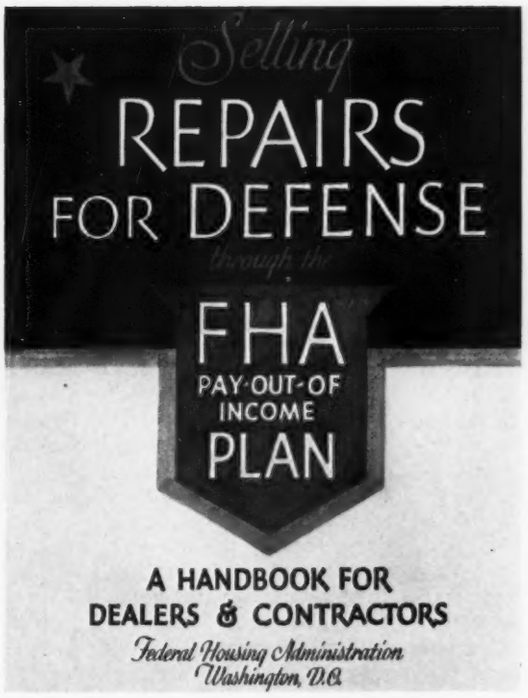
All who participate will be entitled to educational materials supplied by the Federal Housing Administration *without charge*. This material includes:

A new emblem. Features the slogan "Repair for Defense" supplied by the FHA in mat form to newspapers for use in advertisements of building material dealers, contractors, lending institutions, etc.



New "Repair" poster for window display. Colors red, white, blue

New window displays. FHA has prepared a colorful streamer, poster and side pieces for featuring the new repair program in dealers' windows. Included in this material are a window streamer (68″ x 16″) and two vertical side pieces (60″ x 16″). These items lend themselves to a variety of window displays and are attractively illustrated. They are colorfully printed in red, white, blue, and gray. A one-sheet poster printed in the same colors also will be supplied on request. The streamer features repairs; the poster is more specific: "Renovate for Roomers—Remodel for Tenants." This complete assortment is known as Window Display No. 6.



The campaign handbook tells how to make loans, outlines the campaign, describes all display material available, suggests ways of getting repair business.

A new series of newspaper advertisements. Features home repair and remodeling on the FHA Pay-out-of-Income Plan. Builders, contractors, lending institutions, dealers, and others may obtain proofs from their local papers, and FHA will supply copy themes and mats of illustrations to newspapers on request.

"Dealer Guide." A manual of information on the new Title I provisions and how FHA repair loans may be made and handled. This manual also outlines the new "Defense Calls for Home Repairs" program, describes the display and advertising material available, suggest ways to use it most effectively, etc. This "handbook for Dealers and Contractors" is called "Selling Through the FHA Pay-out-of-Income Plan," and copies may be obtained on direct request to the Division of Education, Federal Housing Administration, Washington, D. C.

A new printed folder, "Remodeling Demanded by Defense Housing Program" (FHA Form No. 818). This folder, prepared for dealers and contractors, gives a picture of the present opportunities for repairing and remodeling larger houses into smaller living units, explains the financing available under new FHA terms, and suggests how the building industry may profit. It is supplied by FHA to manufacturers, dealers, builders, lending institutions, and others on request.

Folder, "Defense Calls for Home Repairs." A new version of the popular envelope-size pamphlet designed for the general public. FHA Form No. 810 suggests what to do to make a home rentable and up-to-date. Attractively printed in red and black. Available in limited quantities for direct mail or over-the-counter distribution.

(*Continued on page* 120)

Defense Developments

Silver For Tin in Solder

SILVER may be substituted extensively for tin in solder to conserve tin and hasten accumulation of adequate reserves of it, a committee of the National Academy of Sciences advised OPM in a report made public July 10.

The committee estimated that large-scale replacement of tin in solder, plus a reduction in tin use already being made by can manufacturers at the request of OPM, would reduce total tin consumption about 25 per cent.

Sixty-six million ounces of silver annually should be sufficient for "all-out" replacement of tin in solder, the group said. Forty to fifty pounds of tin may be replaced by 2½ to 5 pounds of silver, it added, and at present prices for tin and for industrial silver the raw material cost of 2½ per cent silver solder is practically identical with that of an equal volume of solder composed of 45 per cent tin and 55 per cent lead.

◆

Defense Homes Progress

MORE than 1,700 defense homes were completed the week ended July 19, making an average of over 1,700 completions a week since the first of July, C. F. Palmer, Coordinator of Defense Housing, announced.

In addition, 3,306 homes were placed under construction contract in the week.

Under the temporary shelter program, 200 trailers were completed for civilian workers at Baltimore, Md., and 400 more placed under construction contract, to be used as "stop-gap" housing at Kingsbury, Ind.; Burlington, Iowa; Jacksonville, N. C.; and Ravenna, Ohio.

In addition, 248 dormitory units for single men were contracted for at Portsmouth, Va., to house civilian workers employed in the shipbuilding industry.

So far, the Division of Defense Housing has allocated 107,643 homes in 170 localities of 49 States and Territories. Of this number, 74,617 have been placed under construction contract, and 22,627 have been completed.

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Regional Priority Offices

DIRECTOR Stettinius announced June 17 the setting up of a Priorities Division field organization. Regional offices were to be opened last week in Boston, New York, Philadelphia, and Chicago. Others will be established soon.

The field offices will be staffed by representatives of the Priorities Division who, following a training period in Washington, will be able to help and advise businessmen and manufacturers who have difficulty with priorities questions.

Two members of the Priorities Division's executive staff, L. Edward Scriven and E. C. Laird, Jr., both assistant deputy directors, will be in charge of the regional field offices.

William P. Homans will be district manager for the Priorities Division in Boston. Mr. Homan's office will be at 3 Pearl Street, Boston.

Phillip M. McCullough is district manager for the Priorities office in New York. His office will be at 33 Liberty Street, New York City.

Frederick W. Slack will be district manager for the Philadelphia office. His office will be at 925 Chestnut Street.

Warren G. Bailey will head the district office in Chicago. His office will be at 230 South LaSalle Street.

To Work with Contract Service

The Priorities Division district managers will work in close cooperation with regional Defense Contract Service coordinators in their areas. They will be equipped to advise businessmen on procedure to be followed in making application for preference ratings, the proper method of filling out forms and questionnaires, methods to be used in adapting their business practices to new conditions, and any other questions in connection with priorities.

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Allot Materials For Repair

MOVING to assure adequate supplies of repair and maintenance parts for such privately owned consumer goods as automobiles, trucks, trailers, and household equipment, the Civilian Supply Allocation Division of the OPACS promulgated July 12 an allocation program giving such materials and equipment a preference over other civilian needs.

By maintaining supplies of repair and maintenance parts, such goods now in existence can be kept in operation. Goods covered by the program include: Passenger automobiles, trucks and tractors, household refrigerators, stoves, ranges, and water heaters, sanitary plumbing fixtures, and furnaces, including oil burners and automatic stokers.

◆

Revise General Metal Order

A REVISION of forms PD-32 and PD-32a, used in connection with General Steel Preference Delivery Order No. 1, is announced.

The revised forms, especially PD-32, are more detailed than the previous ones.

Customers of producers of iron and steel products, if unable to place an order satisfactorily, or if their orders are unduly delayed, may bring the matter to the attention of the Priorities Division by filling out form PD-32.

If the Priorities Division feels that the case justifies such action, it will then send the producer involved form PD-32a, requiring the producer to fill out another form, explaining why the customer's order was delayed or rejected.

The General Steel Preference Delivery Order No. 1 is designed to facilitate the delivery of iron and steel products to defense and essential civilian customers.

Army Buys Cooling

THE War Department has announced authorization for the installation by the Engineer Corps of air conditioning equipment, in the form of humidifying coolers, at Las Vegas Airfield, Nevada; Phoenix-Higley Airfield, Luke Field and Tucson Airfield, Arizona; and Muroc Bombing Range, Victorville Airfield, Bakersfield Airfield, Fresno Airfield, Taft Airfield, Merced Airfield and Lemoore Airfield, all in California.

Investigations conducted by Engineer Corps officers in the field indicated a temperature drop of from 10° to 20° F. when the coolers were used. Consisting of a metal cabinet filled with fine-cut, porous substance such as excelsior, the cabinet is attached outside a window. The filler material is thoroughly wet down with water and a fan on the room side of the cabinet draws wet or humid air through it into the room. Evaporation of this moisture lowers the room temperature.

Theatres, chapels, barracks, hospitals, bachelor officers' quarters, cadet barracks and school buildings on the selected posts all will be equipped with coolers.

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Changes in Zinc Control

SEVERAL changes in the order imposing mandatory industry-wide control on zinc were announced June 30 by Priorities Director Stettinius.

One of the changes provides that a producer, although he must set aside a specified amount for emergency allocation by the Director of Priorities, may make full deliveries of minimum quantities (minimum carload lots in the case of metallic zinc, and 2,000 pounds in the case of zinc oxide or zinc dust) so long as these deliveries do not interfere with the fulfillment of defense orders.

Other changes provide that customers for zinc must file affidavits with their suppliers, stating that customers are not increasing inventories to unnecessary levels; that producers must also file affidavits with the OPM stating their intention to report to the Priorities Division nonobservance of the order on the part of customers.

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The Labor Problem

RECENTLY several leaders in the defense organization appeared before the Committee of the House of Representatives Investigating National Defense Migration. Excerpts from their testimony follow:

Sidney Hillman

Fortunately, there has not yet been any large-scale migration of labor, with its resultant chaos, during this first year of the defense effort, comparable to that which took place in the defense production of the World War. And furthermore, information indicates that the tendency of labor to migrate has not increased in any degree commensurate with the expansion of defense output.

A disorderly labor situation means high turn-over in the plants, and this is both costly to industry and injurious to sufficient production. Plants that have an adequate and well-established labor force should not have that force disrupted by the pirating practices of other plants. Again, an uncontrolled inflow of migratory workers into communities already glutted with defense workers is bound to create serious housing shortages, rising rents, and in some cases health and social problems besides.

Suitable Housing Scarce

It is obvious that in order to insure swift and efficient production of defense materials, there must not only be an adequate supply of qualified labor, but also housing facilities at rent levels within the economic range of that labor. A listing of 68 localities for which the Defense Housing Coordinator has established a quota for private builders shows that in 30 of these localities, private building in 1940 was greater in amount than that recommended by the Coordinator to be privately constructed in 1941, and for 30 localities it was less.

However, we cannot approach this problem solely from the standpoint of the *amount* of housing. We must also concern ourselves with the *type* of housing which defense workers require. Much of the new building consists in dwellings for purchase, whereas much of the requirement of defense workers is for rental housing.

Donald M. Nelson

One of our basic policies has been to avoid, insofar as possible, both undue concentration of orders and undue centralization of industry. Clearly, it would be undesirable to allot so many orders to over-worked communities as to exaggerate inward migration of laborers and thus lead to unhealthy congestion. Likewise, it would be unwise to erect so many new facilities in outlying areas as to cause mushrooming of temporary towns.

Broadly, the distribution of Army and Navy orders has tended to follow rather than to deviate from the previously existing pattern of industrial activity.

When we consider the distribution of War and Navy contracts for new facilities, however, the figures show that supplies contracts have followed the location of industry and its workers; but new facilities have been planned to follow a policy of at least partial decentralization.

◆

Allot Material for Controls

ADEQUATE supplies of the variety of metals needed for the manufacture of thermostatic bimetal, used in temperature control devices, was assured July 22 through a limited allocation program announced by the Civilian Supply Allocation Division of OPACS.

Temperature control devices are essential to the manufacturing processes of many industries and have numerous civilian uses, such as for some types of thermostats in home-heating plants.

Ten Metals Affected

The program directs that the following metals in the quantities stated be allocated monthly to manufacturers of thermostatic bimetal and that, where necessary, the highest civilian preference rating be assigned to such orders:

Nickel, 14.4 short tons; iron, 43.8 short tons; silicon bronze, 9.6 short tons; muntz metal, 2.7 short tons; chromium, 1,320 pounds; manganese, 600 pounds; aluminum, 75 pounds; cobalt, 75 pounds; copper, 300 pounds; and zinc, 210 pounds.

The program, unless sooner terminated, will expire October 19, 1941, and will be administered by the Office of Production Management.

Left—Exterior of house selling for about $2,600, including lot. There is no basement; attic is not finished. Below—Furnace in utility room on first floor. Single return grille below and two warm air pipes showing above. Note special high bonnet (8 foot ceilings) and short runs.

[Defense House Heating]

Gravity Furnace Located On The First Floor Level

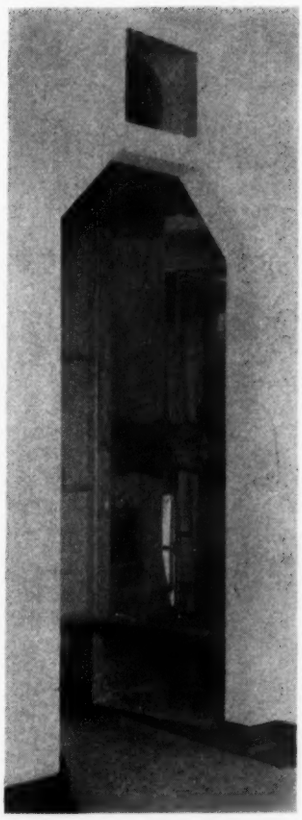
IN KANKAKEE, ILLINOIS, the house and heating installation shown in the photographs and plan was recently inspected by the editors and is published with the thought that this idea can quite conceivably be one answer to the question—"How are we to heat defense worker homes in the $3,500 cost price?"

The house was constructed by Leo Walsh, building contractor and formerly an employee of Henry Reuter & Sons, one of Illinois largest sheet metal, roofing and heating contractors. Mr. Walsh and his relatives built this house themselves and the selling price is, therefore, not a criterion of selling prices for houses of this size. The house will be sold for $2,600 including the lot.

Being a former Reuter employee, Mr. Walsh obtained the furnace from Reuter and installed the heating plant. The interesting idea worked out was decided upon after consultation between members of the two firms.

This heating plant is a regular cast iron, top radiator furnace placed in the utility room as shown in the plan. The heat flow is by gravity and preliminary tests indicate that heating will be uniform and completely satisfactory. The ceilings are 8 feet so that the warm air pipes have a direct rise above the radiator of approximately three feet. Note in one photograph that a special bonnet was used to obtain a plenum space of about 1½ feet.

All pipes are short, the longest run (to a bed room) is less than four feet long—others are even shorter. The warm air pipes to the kitchen and bath are entirely within the utility room; the two



Left — Furnace looking through living-hall doorway. Warm air register in side wall with pipe behind furred-down hall ceiling. Chimney is close to furnace.

Below — Plan of house and heating system. Features are furnace location; short pipes; high registers; and application of gravity flow to a basementless house.

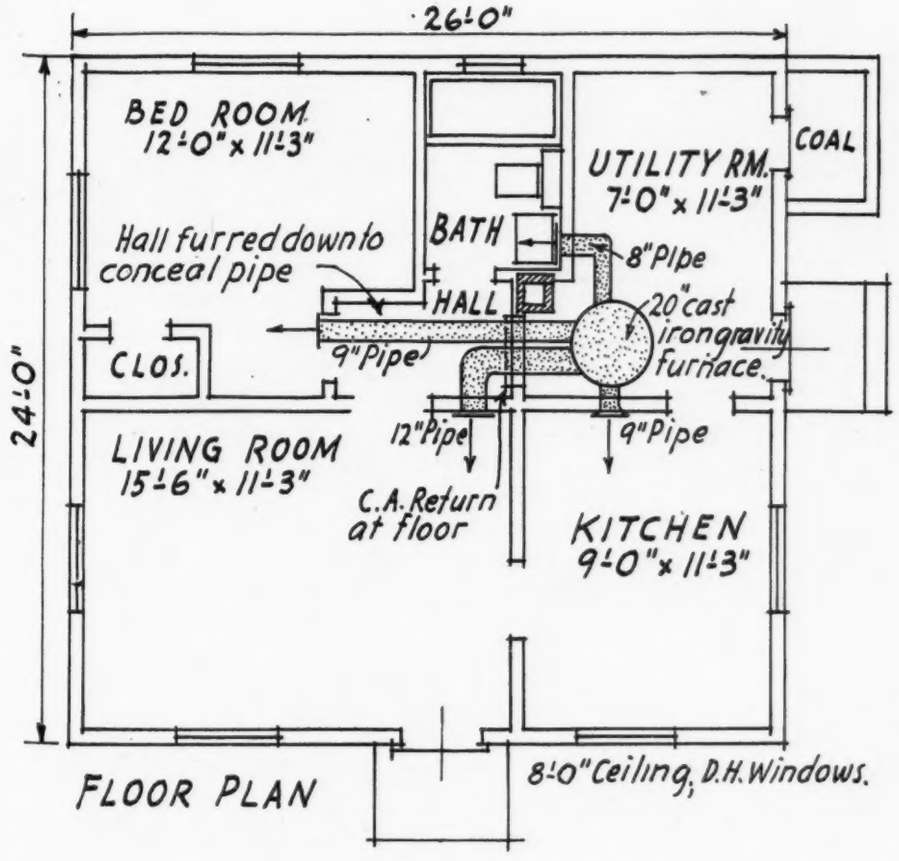
leads to bed room and living room are concealed by a furred down ceiling in the small hall.

The warm air pipes end in registers placed close to the ceiling and located as shown on the plan. Open face registers with valves will be used as directional flow types were not thought necessary in the small rooms.

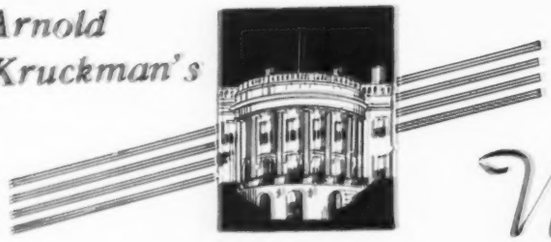
The return consists of a single grille in the hall with a short boot to the back of the furnace. This is shown in one of the pictures. Unless room doors are tightly closed, preliminary trials indicate that this single return will relieve pressure in all rooms of the house.

The general house construction conforms with planners' ideas of houses for defense workers. Wood siding, paper, wood sheathing and Masonite lath on ceiling and outside walls give a heat loss of about 50,000 Btu. There is no basement; all rooms are on one floor, all luxury accessories are omitted—but all necessary fixtures are of good quality. The utility room is planned for general storage, but the coal bin is a "dog house" attached to the house.

Since the gravity furnace with coal fuel constitutes this industries "cheapest" heating system and fuel in northern states, this idea from Kankakee may find wider application.



Arnold Kruckman's



Washington Letter

Latest Defense Area Rulings

JUST a month ago Messrs. Stettinius and Palmer, acting on behalf of OPM Priorities Division and Defense Housing Division, announced formally, "a broad program providing priority aid for defense housing projects, to assure completion of such projects as promptly as possible. This program puts defense housing ahead of civilian and non-defense housing projects and will assure a steady flow of necessary building materials to projects essential to the national defense. No Priority aid will be granted for defense housing publicly and privately financed until cleared through the Coordinator for Defense Housing or his field representatives."

The announcement stated "priority may be given to a publicly financed housing project or to private defense projects within a designated area. With concurrence of Army and Navy Munitions Board the Priorities Division will give each publicly financed housing project, or any area named by the Defense Housing Coordinator, preference ratings appropriate to the national defense activity to be served. Applicants will be able to secure ratings—that is, Priority Certificates—from local representatives appointed by the Coordinator with approval of the Priorities Division."

The announcement also stated "materials on the Critical List will be especially speeded in delivery to contractors having priority ratings. Rating may be used only for orders or contracts involving the use of Critical list items."

New Material Specifications

At this writing Stettinius, Palmer, Ferguson of FHA, Henderson of OPACS, and others have been debating the details of those Critical items almost daily.

You can get the drift of what may be ahead from the changes in specifications recently announced by the Procurement Division. It is ordered where ever zinc coating has heretofore been specified, substitution shall be supplied by electroplating or sherardizing. In the case of corrugated cans a tightly adherent metallic, painted, lacquered or enameled corrosion protective coating is specified. In place of brass, zinc, and muntz metal nails, etc., the specifications now call for copper or steel cement-coated, copper-clad, coppered, painted, japanned, or a chemically treated surface. The chemical treatment shall be in hot solutions of phosphate salts. Painted and zinc-coated (galvanized) steel is deleted from all specifications.

What Is a Defense Area

If you are puzzled to find a definition for a defense area and what it is supposed to include, it may console you to know that no one here has yet been able to give a clear meaning to the term. You see, some defense areas extend over a hundred miles away from the defense industrial centers because the workers are obliged to find shelters remote from the places where they work. Most of the defense areas will be the 200 or more places which have been designated by the President under FHA Title VI.

Under building priorities any residential structure in a defense area will be eligible for a priority rating. It is expected the rating will be placed in the military bracket, somewhere around A-10. The highest preference rating will be given to those who build homes that will rent for $50 a month, or less; and for homes that will sell for under $4,000.

The general idea is to focus interest on inexpensive structures, but to encourage almost any moderate building operation in a defense area. The hope is that a new structure, even if expensive, will release an older dwelling for those who can not pay as much as those in the higher brackets. And it is hoped that the older homes, thus released, may sometime be transformed into dwellings for several families.

The object of the defense-area-building-materials-rationing is to restrict new building to the defense housing areas. But it is also true that 85% of all new residential building last year took place in these same areas, the total of new homes built being 600,000 during the year ending June 30, 1941. It is pointed out that at least 625,000 new homes are scheduled to be built in the year ending June 30, 1942. In addition there will inevitably be a considerable volume of business-building in defense areas, structures such as stores, small factories, warehouses and similar facilities.

Special priorities have been announced for all work devoted to maintenance and repair of existing structures and their facilities. Preference ratings are available for all manufacturers and contractors and suppliers who are engaged in maintaining and repairing any of the products or services essential to the daily life of the people of the nation. OPACS early in July made a special allocation of materials and equipment for the maintenance and repair of privately-owned household furnaces, oil burners, automatic stokers and similar equipment.

It is planned to provide priorities for the materials and equipment to repair and maintain the structures of commerce and industry. Thus the industries serving the various phases of building, and the things that go into buildings, appear to have a reasonable opportunity to operate briskly, particularly if they take on some of the defense work.

Defense Areas

Following is a list of defense housing areas in the U. S. as designated under Title VI by the latest Executive Order.

Arkansas: Little Rock. **Alabama:** Anniston, Birmingham, Florence-Sheffield-Tuscumbia, Gadsden, Mobile, Montgomery. **Connecticut:** Bridgeport, Bristol, Hartford, Meriden, New Britain, New Haven-Ansonia, New London, Groton, Waterbury. **California:** (Northern District)—Richmond, San Francisco and East Bay Cities, Vallejo; (Southern District): Los Angeles, San Diego. **Colorado:** Denver. **Delaware:** Wilmington. **District of Columbia:** Washington. **Florida:** Panama City, Tallahassee, Val-

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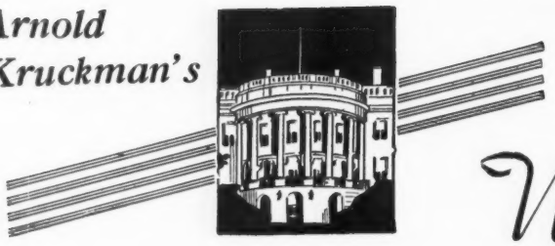
RESIDENTIAL AIR CONDITIONING

SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Arnold Kruckman's



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(*Continued on page* 119)

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING

SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

A SALES METHOD *that's Working*

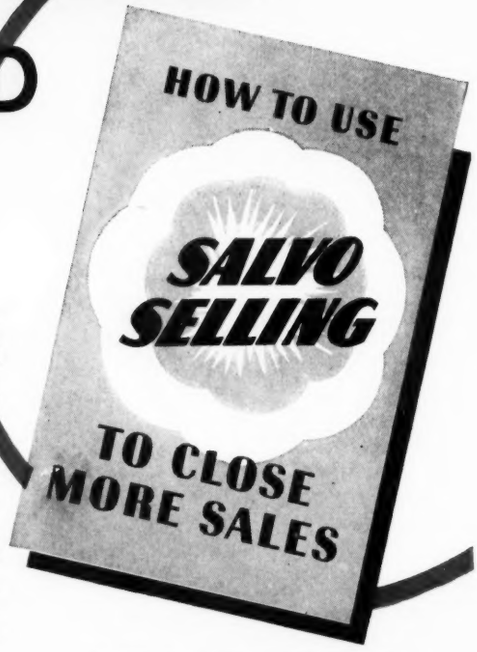
A simple bit of sales psychology that any dealer or salesman can use to turn more prospects into buyers—that's Salvo Selling. It's no mere theory—it really works, as letters and reports from all over the country are proving right now.

In times like these, with more prospects having money to buy, selling is undoubtedly easier. But that condition won't last forever. The dealer who uses the Salvo Selling method is not only increasing his share of available business today, but is building a stronger position for tomorrow.

When you sell an automatic heating job, sell a *unit*, not a collection of parts. That way you secure *concentrated impact* (the "Salvo effect") on your prospect's mind. You avoid confusion. You eliminate useless argument and comparison. You close sales more surely, more easily—and more often.

Such a brief outline of Salvo Selling can't tell the whole story. Details and explanations are contained in a booklet which is yours for the asking. If you want more results from your selling efforts—now and in the future—a postcard or a letter will bring your copy without cost or obligation.

There's a New Leader in the Control Field



SEND FOR FREE BOOK

This handy, pocket-size book may actually be worth real money to you. The ideas it contains are based on actual work by leading salesmen. It will help you improve your own selling. Send for your free copy.

PERFEX CORPORATION

500 West Oklahoma Avenue
Milwaukee, Wisconsin

Commercial Ventilation with Housed Fans

Can be easy to sell if the benefits of ventilation are honestly explained to prospects

By Lawrence E. Gichner
Gichner Inc., Washington, D. C.

PUBLIC demand for proper ventilation will probably be greater this year than ever. Sales should be definitely on the increase. Profits should also be larger.

Five years ago there were comparatively few attic and belt driven fans in use. Today there are dozens, scores, hundreds, even thousands of installations in communities all over the country. On account of this tremendous popular acceptance, fans today require far less selling effort. Neighbors have told friends how successfully they work and friends are ready to buy.

Whether it be a factory, store, office, restaurant, beauty parlor, theater or home there is a fan that will do a job of cooling. Regardless of how difficult the problem, there are ways it can be solved. Proof of feasible solutions are shown in accompanying installations our firm has sold.

A row house job with a pitched slate roof and no gable ends presented a difficult situation, but not for long. The only access to a rear adjacent flat slag roof was through a tin clad trap door. This passage could not be eliminated, but it could be utilized. This we did by building up higher our fan housing and by putting a door in its side. (See Fig. 1.)

The illustration shows the fan shut off for winter by a sliding metal panel which is easily slipped off the first hot day. This panel eliminates adjustable louvers, reduces resistance, increases efficiency and permits the system to act as a gravity ventilator when the fan is not running.

Focused correctly, with ample overhanging hood, no rain will blow through the open area.

Ventilation is all-important to comfort in laundries where employees labor near burning hot

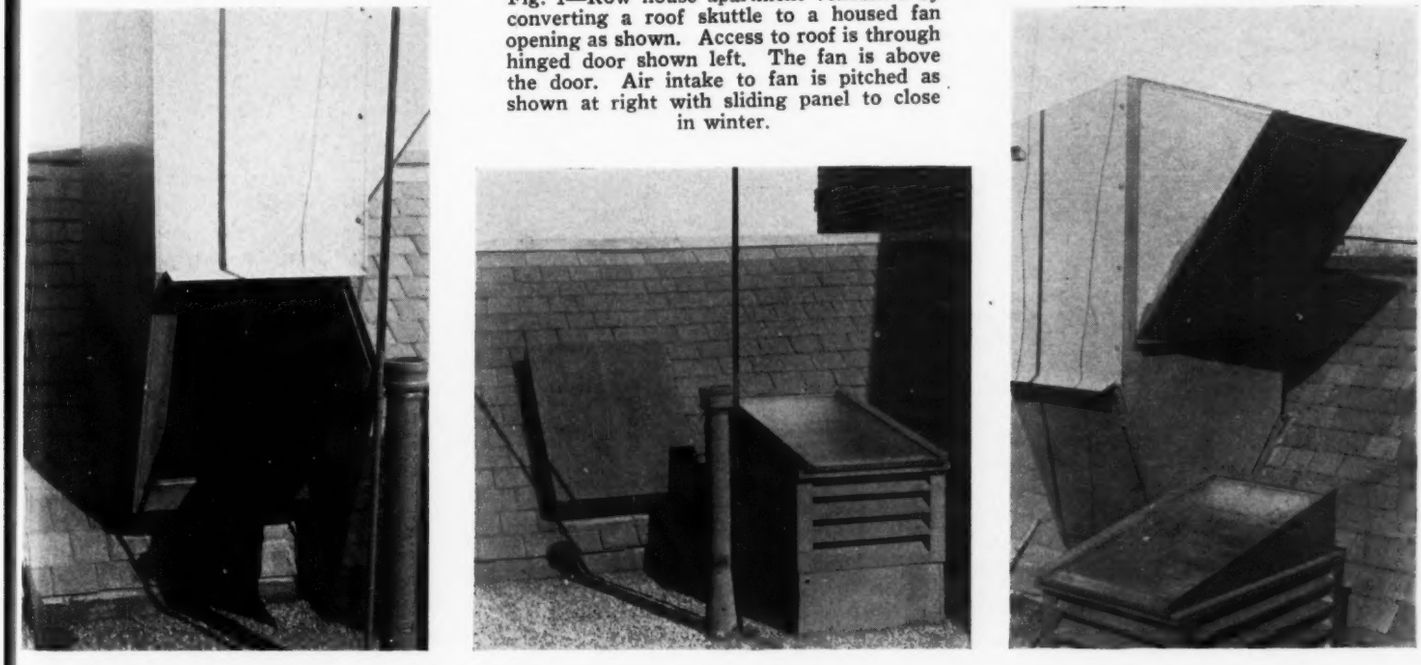
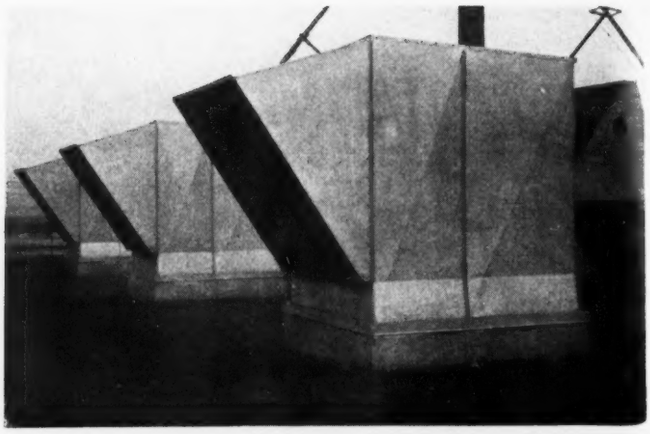


Fig. 1—Row house apartment ventilated by converting a roof skuttle to a housed fan opening as shown. Access to roof is through hinged door shown left. The fan is above the door. Air intake to fan is pitched as shown at right with sliding panel to close in winter.



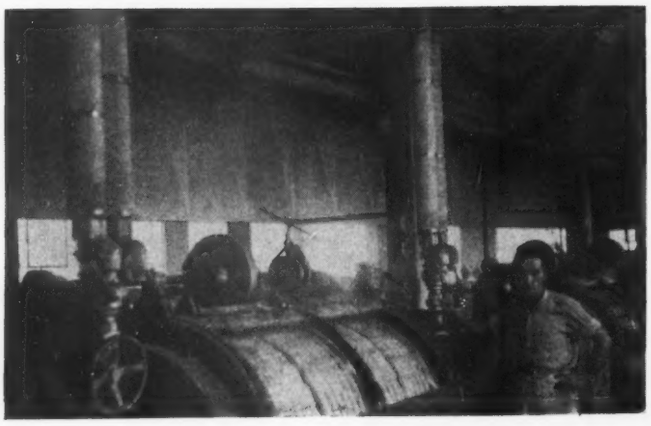
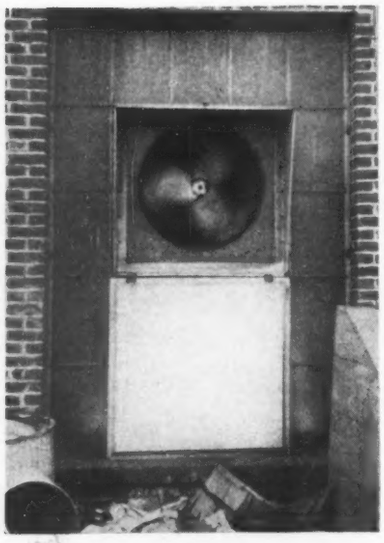
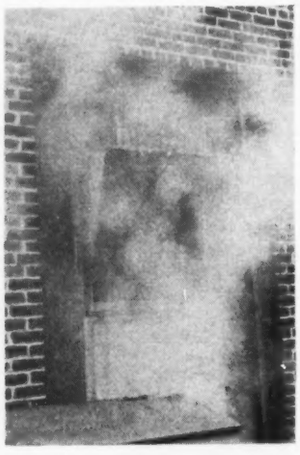
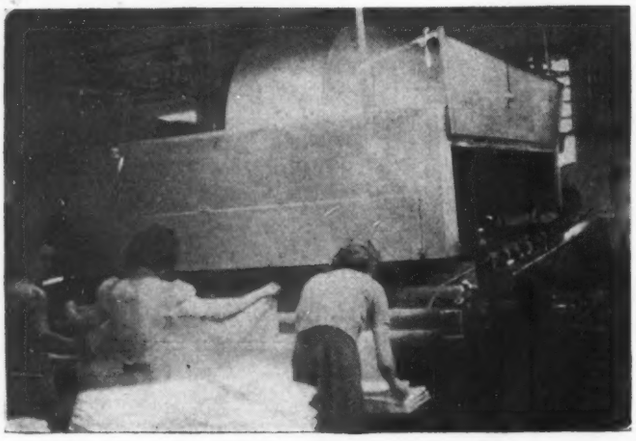


Fig. 2—Gravity roof ventilators on a laundry were replaced with housed fans (right, above). The heat producing tumblers were enclosed in a ceiling wall and ventilation secured. Below—Fig. 3—Flat work ironers were housed in as shown below. The large duct connects with window-placed fans which really work.







machinery. But even a greater problem faced the management of the Baltimore Towel Supply & Laundry Co. Newly ironed towels and linens were being spoiled by large drops of condensation that formed and plopped down from the ceiling.

Various suggestions were submitted by different firms. Some ideas were for the installation of unit heaters which would, supposedly, warm the ceiling and reduce condensation.

A Laundry Installation

Our plan for baffling in the rows of tumblers and hooding over the large flat work ironers, which were the original source of the expensive annoyance, was believed feasible. We were commissioned to execute our proposal. Figure 2 shows our plan and its application.

Existing gravity ventilators on the roof were removed. Three large 48-inch belt driven fans were put in their stead. A wall of galvanized sheets was dropped six feet from the ceiling around the area occupied by the tumblers, washers, and dryers. This metal baffle eliminated spreading by restricting the steam and vapors to a confined area where the fans could readily exhaust the damaging moisture laden clouds. (Fig. 2.)

Large 10 foot by 12 foot metal housings were constructed over the flat work irons. From the center of each housing a large duct was run to the nearest window, in which a 30-inch belt driven exhaust fan was mounted. The ducts themselves

were 30x30 inches square. (Fig. 3.)

We have made it an important and successful policy to never design a duct smaller in area than the square area of its diameter. In other words for a 24-inch fan we have either a 24x24-inch duct or a duct equivalent to 576 square inches.

By the ducts being 25 to 30 per cent greater in area than the fan opening itself, we are able to cut down resistance to a minimum and be assured of a good flow of air.

It is positively amazing the idiotic things which are daily being done in the name of ventilation and people wonder why their system don't function.

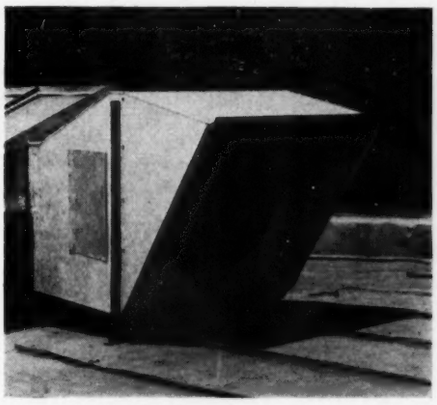
One block from our shop is a restaurant. In the kitchen window they erected a 15-inch fan. They built a housing over the fan and extended a 6-inch duct up three stories. That didn't work so the owners disconnected the duct at the housing and now the 15-inch fan is blowing through a 6-inch hole. Possibly quite an improvement, but still the fan is moving less than a quarter of its capacity.

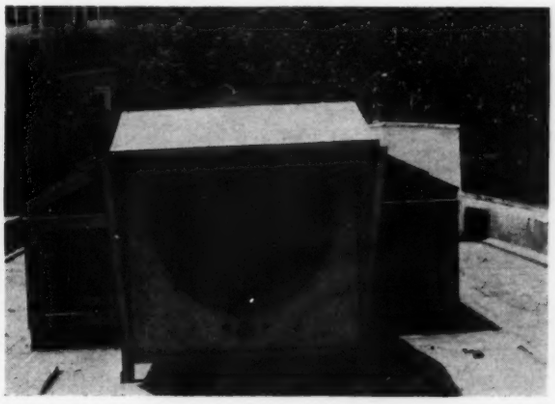
Resistance Nullifies a Hotel System

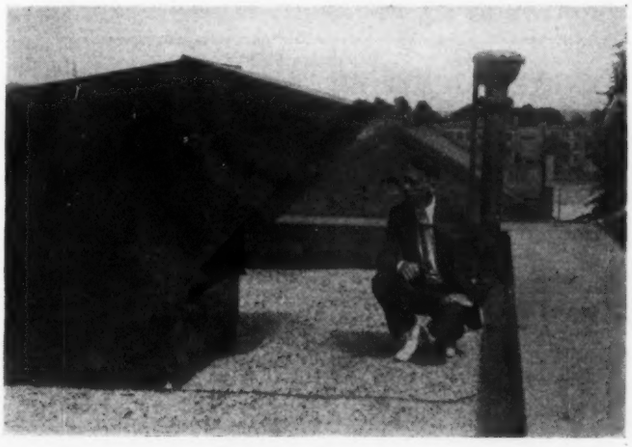
A hotel called us in on a ventilating problem that was similar to the above. They had just spent a lot of money to avoid having kitchen aromas drift into their main lobby, but the soluton was something to conjure with.

An 18-inch fan was installed over the stove and bluntly blowing into a 12-inch round duct. The duct extended up seven stories. Five elbows were used to curve the pipe around a protruding cornice. A hood covered the duct at the roof.

Although far from perfect, the result could be considerably improved by providing a long taper piece at the fan, reducing the pipe gradually from 18 inches to 12 inches. The five elbows curving around the protruding cornice could be reduced to one easy angle that set up far less resistance. The hood at the roof, which choked the air that was coming through, could be completely removed.







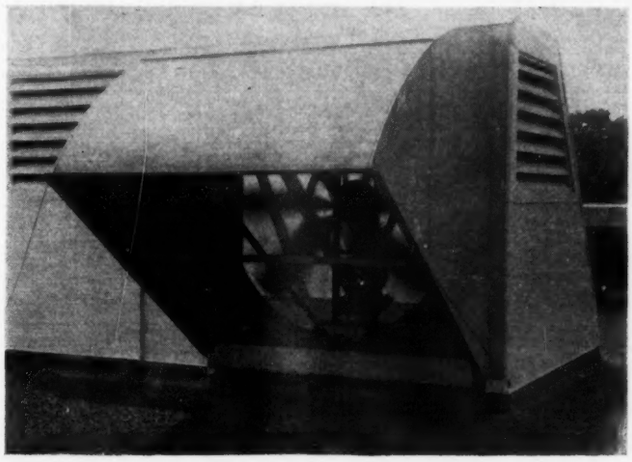


Fig. 4—Housed fans of several types. Above—Fan in end of a skylight provides both light and air. Center—Gichner likes this type of housing for flat roofs. Bottom—Special housing with louvres provides gravity ventilation with positive fan ventilation when needed.

◆

An old problem that is encountered weekly is where fans are installed in windows immediately next to open windows or doors. The proximity to outside air short circuits the efficiency of the fan and reduces the effect greatly in areas which the fans are meant to relieve.

If two simple little rules are observed there should be no conditon under which fans will not work to fullest satisfacton. One is don't stint. Make sure the fan is of sufficient size to do an adequate job. Two, if a duct is necessary, make that duct plenty large and in area equal to the square

(*Continued on page* 117)

Air Conditioning for Builders [Part 2]

Part 1 of this article was published in the July issue. In July Mr. Dean graphically described some of the reasons why builders and architects should pay more attention to heating specifications and why good heating is essential. This Part 2 presents some simplied engineering data which permit quick design and rapid checking by architect or builder.

By Carl H. Dean
Oklahoma Natural Gas Company

THE science of heating is not an exact science, but is a speculative one that is constantly being developed. Residential heating is not too complicated to be readily learned and only mental laziness hinders anyone from acquiring an understanding of the fundamentals sufficient to protect himself or his clients from being gypped.

Man finds it necessary to set up units of measurement for intangibles. So he blocks off a chunk of space and calls it a mile, he has speedometers to tell how fast he is going, anemometers to tell how fast the wind blows, thermometers to tell how hot he is, so of course he must measure another equally inexplicable phenomena known as heat. The commonly used unit of measurement of heat is known as a B.t.u. meaning the British Thermal Unit. There are 180 degrees on the Fahrenheit scale from the freezing point to the boiling point of water at sea level. Approximately 180th part of the amount of heat required to raise the temperature of a pound of water from 32 deg. F. to 212 deg. F. is a B.t.u. There is a slight variation in the amount of heat required to raise the temperature of water at various temperatures, but for practical purposes we assume a B.t.u. to be the amount of heat required to raise the temperature of one pound of water one degree F.

To solve any heating problem we must know

Chart A

FULL AREA OF TWO-PANE WINDOWS IN SQ. FT.

	Height Glass		18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"	50"	52"
Width Glass	Width Opening	Height Opening	42"	46"	50"	54"	58"	62"	66"	70"	74"	78"	82"	86"	90"	94"	98"	102"	106"	110"
16"	20"		5.8	6.4	7.0	7.5	8.0	8.6	9.2	9.7	10.3	10.8	11.4	11.9	12.5	13.0	13.6	14.2	14.7	15.2
18"	22"		6.4	7.0	7.6	8.2	8.9	9.5	10.1	10.7	11.3	11.9	12.5	13.1	13.7	14.3	15.0	15.6	16.2	16.8
20"	24"		7.0	7.7	8.3	9.0	9.7	10.3	11.0	11.7	12.3	13.0	13.6	14.3	15.0	15.6	16.3	17.0	17.7	18.3
22"	26"		7.6	8.3	9.0	9.7	10.5	11.2	11.9	12.6	13.4	14.0	14.7	15.5	16.2	17.0	17.7	18.4	19.2	19.8
24"	28"	STANDARD SIZES OF TWO-LIGHT WINDOWS	8.2	8.9	9.7	10.5	11.3	12.0	12.8	13.6	14.4	15.1	15.9	16.7	17.4	18.2	19.0	19.8	20.6	21.4
26"	30"		8.7	9.6	10.4	11.2	12.0	12.8	13.7	14.6	15.4	16.2	17.1	17.9	18.7	19.5	20.4	21.2	22.0	23.0
28"	32"		9.3	10.2	11.1	12.0	12.9	13.8	14.7	15.5	16.4	17.3	18.2	19.1	20.0	20.8	21.8	22.6	23.5	24.4
30"	34"		10.0	10.8	11.8	12.8	13.7	14.6	15.6	16.5	17.5	18.4	19.3	20.3	21.2	22.2	23.2	24.0	25.0	26.0
32"	36"		10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5
34"	38"		11.0	12.1	13.2	14.3	15.3	16.4	17.4	18.5	19.5	20.6	21.6	22.6	23.7	24.8	25.8	27.0	28.0	29.0
36"	40"		11.7	12.8	13.9	15.0	16.1	17.2	18.3	19.5	20.5	21.6	22.8	23.8	25.0	26.1	27.2	28.3	29.4	30.5
38"	42"		12.2	13.4	14.6	15.8	16.9	18.0	19.2	20.4	21.6	22.7	24.0	25.0	26.2	27.4	28.6	29.8	31.0	32.1
40"	44"		12.8	14.0	15.3	16.5	17.7	18.9	20.1	21.4	22.6	23.8	25.1	26.2	27.4	28.7	30.0	31.2	32.4	33.6
42"	46"		13.4	14.7	16.0	17.3	18.5	19.8	21.0	22.4	23.6	24.9	26.2	27.4	28.6	30.0	31.3	32.6	33.8	35.0
44"	48"		14.0	15.3	16.7	18.0	19.3	20.7	22.0	23.4	24.6	26.0	27.3	28.6	30.0	31.3	32.6	34.0	35.3	36.5
46"	50"		14.6	16.0	17.4	18.8	20.1	21.5	23.0	24.4	25.6	27.1	28.4	29.8	31.2	32.6	34.0	35.5	36.8	38.2
48"	52"		15.2	16.6	18.0	19.5	20.9	22.4	23.8	25.3	26.7	28.1	29.5	31.0	32.4	34.0	35.4	36.8	38.3	39.6
50"	54"		15.7	17.2	18.7	20.3	21.8	23.2	24.8	26.2	27.7	29.2	30.7	32.2	33.7	35.2	36.7	38.2	39.7	41.2
52"	56"		16.3	17.9	19.4	21.0	22.5	24.0	25.6	27.2	28.7	30.3	31.8	33.4	35.0	36.5	38.0	39.6	41.2	42.7
54"	58"		16.9	18.5	20.1	21.8	23.4	25.0	26.6	28.2	29.8	31.4	32.9	34.6	36.2	37.8	39.5	41.0	42.7	44.3
56"	60"		17.5	19.3	20.8	22.5	24.2	25.8	27.5	29.0	30.8	32.5	34.0	35.8	37.5	39.8	40.8	42.5	44.2	46.0

Chart B

WARM · AIR · HEATING · CHARTS

FOR ESTIMATING:- *1-C.F.M. by B.T.U. LOSS-TEMP. RISE METHOD. *2-C.F.M. by NO. AIR CHANGES PER. HR. METHOD. *3-SQ. IN. REG. FREE AREA or PIPE AREA for FORCED CIR. SYSTEMS. *4-SQ. IN. REG. FREE AREA or PIPE AREA for GRAVITY CIR. SYSTEMS.

CHART *1

C.F.M. REQUIRED TO DELIVER VARIOUS AMT'S of B.T.U'S At DIFF. TEMP. RISES at REG.

B.T.U LOSS Per. HR.	TEMP RISE of AIR at REG.				
	65°F	75°F.	85°F.	95°F.	105°F.
1500	21.2	18.3	16.2	14.5	13.1
1750	24.7	21.4	18.9	16.9	15.3
2000	28.2	24.4	21.6	19.3	17.5
2250	31.7	27.5	24.3	21.7	19.6
2500	35.3	30.5	27.0	24.1	21.8
2750	38.8	33.6	29.6	26.5	24.0
3000	42.3	36.6	32.3	28.9	26.2
3250	45.8	39.7	35.0	31.4	28.4
3500	49.4	42.7	37.7	33.8	30.6
3750	52.9	45.8	40.4	36.2	32.7
4000	56.4	48.8	43.1	38.6	34.9
4250	59.9	51.9	45.8	41.0	37.1
4500	63.5	54.9	48.5	43.4	39.3
4750	67.0	58.0	51.2	45.8	41.5
5000	70.5	61.0	53.9	48.2	43.7
5500	77.6	67.1	59.3	53.1	48.0
6000	84.6	73.2	64.7	57.9	52.4
6500	91.7	79.3	70.1	62.7	56.7
7000	98.7	85.4	75.5	67.6	61.1
7500	105.8	91.5	80.9	72.4	65.5
8000	112.8	97.6	86.2	77.2	69.8
8500	119.9	103.7	91.6	82.0	74.2
9000	126.9	109.8	97.0	86.9	78.6
9500	134.0	115.9	102.4	91.7	82.9
10000	141.0	122.0	107.8	96.5	87.3
15000	211.5	183.0	161.7	144.8	130.9
20000	282.0	244.0	204.8	193.0	174.6
25000	352.5	305.0	269.5	241.3	218.3
30000	705.0	610.0	539.0	482.6	436.6
75000	1057.5	915.0	808.6	723.9	654.9
100000	1410.0	1220.0	1078.0	965.2	873.2
150000	2115.0	1830.0	1617.0	1447.8	1309.8

$C.F.M. = \frac{B.T.U\ LOSS\ Per.\ HR. \times 55}{TEMP.\ RISE \times 60}$

60°-85°F. TEMP RISE RECOMMENDED FOR *HOUSE HEATING. 85°-105°F. TEMP. RISE RECOMMENDED FOR INDUSTRAL or ASSEMBLY HALLS

CHART *2

C.F.M. REQUIRED TO CHANGE AIR IN ROOMS HAVING VARIOUS CUBAGE DIFF. NO TIMES Per. HR.

Cubical Contents	No. AIR CHANGES Per. HR.				
	3	4	5	6	7
250	12.5	16.7	20.8	25.0	29.3
300	15.0	20.0	25.0	30.0	35.1
350	17.5	23.3	29.2	35.0	40.9
400	20.0	26.6	33.3	40.0	46.8
450	22.5	30.0	37.5	45.0	52.7
500	25.0	33.3	41.7	50.0	58.5
600	30.0	40.9	50.0	60.0	70.2
700	35.0	46.6	58.3	70.0	81.9
800	40.0	53.3	66.6	80.0	93.6
900	45.0	59.9	74.9	90.0	105.3
1000	50.0	66.6	83.3	100.0	117.0
1500	75.0	99.9	124.9	150.0	175.5
2000	100.0	133.2	166.6	200.0	234.0
2500	125.0	166.5	208.3	250.0	292.5
3000	150.0	199.8	249.9	300.0	351.0
3500	175.0	233.1	291.6	350.0	409.5
4000	200.0	266.4	333.2	400.0	468.0
4500	225.0	299.7	374.9	450.0	526.5
5000	250.0	333.0	416.5	500.0	585.0
6000	300.0	399.6	499.8	600.0	702.0
7000	350.0	466.2	583.1	700.0	819.8
8000	400.0	532.8	666.4	800.0	936.0
9000	450.0	599.4	749.7	900.0	1053.0
10000	500.0	666.0	833.0	1000.0	1170.0
15000	750.0	999.0	1249.5	1500.0	1755.0
20000	1000.0	1332.0	1666.0	2000.0	2340.0
25000	1250.0	1665.0	2082.5	2500.0	2925.0
30000	1500.0	1998.0	2499.0	3000.0	3510.0
35000	1750.0	2331.0	2915.5	3500.0	4095.0
40000	2000.0	2664.0	3332.0	4000.0	4680.0
45000	2250.0	2997.0	3748.0	4500.0	5265.0
50000	2500.0	3330.0	4165.0	5000.0	5850.0

$C.F.M. = \frac{CU.CON. \times NO.\ AIR\ CH.\ Per.\ HR.}{60}$

3-5 AIR CHANGES Per. HR. FOR HOUSE HEATING. 5-7 AIR CHANGES FOR INDUSTRAL Or ASSEMBLY HALLS

CHART *3

SQ. IN. REG. FREE AREA Or PIPE AREA for VARIOUS AMT'S. of AIR At DIFF. VEL. IN CUBIC FT. of AIR Per. MIN.

C.F.M. DELIVERY	VELOCITY THRU REG. or DUCT IN FT. Per. MIN.						
	200	300	400	500	600	700	800
15	10.8	7.2	5.4	4.3	3.6	3.1	2.7
20	14.4	9.6	7.2	5.8	4.8	4.1	3.6
25	18.0	12.0	9.0	7.2	6.0	5.1	4.5
30	21.6	14.4	10.8	8.6	7.2	6.2	5.4
35	25.2	16.8	12.6	10.1	8.4	7.2	6.3
40	28.8	19.2	14.4	11.5	9.6	8.2	7.2
45	32.4	21.6	16.2	12.9	10.8	9.2	8.1
50	36.0	24.0	18.0	14.4	12.0	10.3	9.0
60	43.2	28.8	21.6	17.3	14.4	12.3	10.8
70	50.4	33.6	25.2	20.2	16.8	14.4	12.6
80	57.6	38.4	28.8	23.0	19.2	16.5	14.4
90	64.8	43.2	32.4	25.9	21.6	18.5	16.2
100	72.0	48.0	36.0	28.8	24.0	20.6	18.0
200	144.0	96.0	72.0	57.6	48.0	41.1	36.0
300	216.0	144.0	108.0	86.4	72.0	61.7	54.0
400	288.0	192.0	144.0	115.2	96.0	82.3	72.0
500	360.0	240.0	180.0	144.0	120.0	102.9	90.0
600	432.0	288.0	216.0	172.8	144.0	123.4	108.0
700	504.0	336.0	252.0	201.6	168.0	144.0	126.0
800	576.0	384.0	288.0	230.4	192.0	164.6	144.0
900	648.0	432.0	324.0	259.2	216.0	185.1	162.0
1000	720.0	480.0	360.0	288.0	240.0	205.7	180.0
1200	864.0	576.0	432.0	345.6	288.0	246.8	216.0
1400	1008.0	672.0	504.0	403.2	336.0	288.0	252.0
1600	1152.0	768.0	576.0	460.8	384.0	329.1	288.0
1800	1296.0	864.0	648.0	518.4	432.0	370.3	324.0
2000	1440.0	960.0	720.0	576.0	480.0	411.4	360.0
3000	2160.0	1440.0	1080.0	864.0	720.0	617.1	540.0
3500	2520.0	1680.0	1260.0	1008.0	840.0	720.0	630.0
4000	2880.0	1920.0	1440.0	1152.0	960.0	822.8	720.0
4500	3240.0	2160.0	1620.0	1296.0	1080.0	925.7	810.0
5000	3600.0	2400.0	1800.0	1440.0	1200.0	1028.6	900.0

$\square$"REG. F.A or P.A = $\frac{C.F.M. \times 144}{VEL.\ IN\ FT.\ Per.\ MIN.}$

200-300 F.P.M. VEL. THRU REG. for H. HEATING. 400-800 F.P.M. for INDUSTRAL WORK. 400-800 VELOCITY IN HEAT DUCTS.

CHART *4

SQ. IN. REG. FREE AREA or PIPE AREA for GRAVITY CIRCULATING SYSTEMS by STANDARD CODE.

B.T.U. LOSS Per. HR.	FLOOR			
	1st.	2nd.	3rd.	Av. 1st & 2nd.
1500	13.5	8.9	7.5	10.8
1750	15.7	10.5	8.8	12.7
2000	18.0	11.9	10.0	14.5
2250	20.3	13.4	11.2	16.3
2500	22.5	14.9	12.5	18.1
2750	24.8	16.4	13.8	20.0
3000	27.0	18.0	15.0	21.7
3250	29.2	19.4	16.2	23.5
3500	31.5	20.9	17.5	25.5
3750	33.8	22.1	18.8	27.2
4000	36.0	23.9	20.0	29.0
4250	37.4	25.4	21.2	30.8
4500	40.5	27.9	22.5	32.6
4750	42.8	28.4	23.8	34.4
5000	45.0	30.0	25.0	36.2
5500	49.5	32.9	27.5	39.8
6000	54.1	35.9	30.0	43.4
6500	58.6	38.9	32.5	47.1
7000	63.1	41.9	35.0	50.7
7500	67.6	45.0	37.5	54.3
8000	72.1	47.9	40.0	58.0
8500	76.6	50.9	42.5	61.6
9000	81.1	53.8	45.0	65.9
9500	85.6	56.8	47.5	68.8
10000	90.1	59.9	50.0	72.5
15000	135.5	86.2	52.5	108.7
20000	180.2	119.7	100.0	144.9
25000	225.2	149.1	125.0	181.1
30000	270.2	179.6	150.0	217.4
35000	315.3	209.8	175.0	253.6
40000	360.4	239.5	200.0	290.0
45000	405.4	270.0	225.0	324.0
B.T.U Per. □"	111	167	200	139

□"REG. F.A or P.Area = $\frac{B.T.U.\ LOSS\ Per.\ HR.}{BTU/SQ.IN.\ for\ FLOOR}$

DUCTS HAVE 1" PITCH Per. FT. of HORIZ. PIPE. ADD 2% TO AREA for EACH FOOT OVER 12'-0"

what the problem is. Good heating practice is to take 70 deg. F. as design temperature for inside and 15 deg. above the lowest recorded temperature in the last 15 years as design temperature for outside. Therefore our standard specifications call for heating equipment in this area to maintain a temperature of 70 deg. F. with mercury at 0 deg. F. outside and a wind velocity of 14 miles per hour. Note the word maintain. We do not say raise the temperature from 0 deg. F. to 70 deg. F. but to *maintain*, thus assuming that the structure has been heated during the period prior to the zero temperature. Thus the flywheel effect of a maintained temperature will permit the heating system to carry the load of temperatures 15 deg. below the design for short periods and especially so since there are seldom hard winds at the extreme low temperature. I hope that is a satisfactory explanation of our design of 70 deg. range of temperature in heating specifications.

Simplifying Heat Loss

To simplify our calculations we have taken the most common combinations of building material used in our residences, multiplied the coefficients of heat transfer by 70, and divided into 1,000 to determine the number of square feet of exposed construction that would transmit 1,000 B.t.u. of heat in one hour with 0 deg. F. on one side and 70 deg. F. maintained on the other. We find that 53 square feet of standard brick veneer, 57 square feet of good frame, 40 square feet of lath and plaster ceiling, 190 square feet of the same ceiling when insulated with rock wool, 12.6 square feet of window or door opening, all have equivalent heat loss of approximately 1,000 B.t.u. per hour. Now we are gettng somewhere.

Certainly it is no great problem to measure the full sash openings and outside doors of a residence. Divide the area in square feet by 12.6. Deduct this area from the area of the outside walls and divide the remainder by 53. Take the ceiling area and divde by the factor suited to the construction and also figure the floor if there is no basement dividing by 98. Add the results and you have the amount of heat that must be supplied to replace that transmitted through the construction.

Don't Forget Infiltration

One thing remains and perhaps the most important one. We haven't heated the air itself and don't forget that 14 mile wind. Many heating engineers measure the perimeter of all openings on the two adjoining sides having the greatest area of openings and estimate the width of the cracks and velocity of the wind and the amount of air that will go through and when they have finished they add 25 per cent or 50 per cent if it doesn't look like enough to them. Sometimes it would be better if they had guessed at it first. For all practical purposes you may consider that you will have one change of air per hour in the average residence due to infiltration from wind pressure, opening of doors, etc. Our friend the B.t.u. will raise the temperature of a cubic foot of air 55 deg. F. so if you divide the cubic contents of the house by 800 you will have the thousands of B.t.u. for infiltration; add these to your transmission losses and you have the approximate B.t.u. delivery required of the heating system. If you are building outside town or on the southeast or southwest corner of an intersection or broadside on an east and west street thus getting full north exposure add 15 per cent.

Some Quick Figuring Charts

Accompanying this Part 2 are copies of a chart for quick figuring the square feet of outside openings (Chart A), four warm air heating charts (Chart B), and a data sheet for use in estimating heating costs in Tulsa. Table A of the gravity heating code gives factors for most of the common types of residential construction. Let us assume a living room with 18,000 B.t.u. loss. A forced air heating system is to be installed designed for 140 deg. register temperature and 400 feet per minute branch duct velocity. Chart No. 1 of Chart B at 75 deg. F. rise shows 122 C.f.m. for 10,000 B.t.u. and 97.6 for 8,000 B.t.u. or a total of 219.6 C.f.m. Chart No. 3 at 400 feet per minute velocity shows 72 square inches for 200 C.f.m. and 7.2 for 20 C.f.m. or a total of 79.2 square inches pipe area required.

In Table 5 of the Mechanical Code 80.1 square inches is shown as the area of 10.1 inch diameter pipe. If round pipes are to be used a 10 inch pipe would be required for the room. If rectangular pipes are to be used, the Mechanical Code shows that either 6 x 14 or 8 x 10 is correct for rectangular duct for equal friction. This procedure enables you to check any pipe size for any room in the house.

Don't Be Too Optimistic on Heating Costs

On your data sheet on heating costs use 70 per cent overall efficiency for the system. This is as high an efficiency as is readily obtainable in most residences. The living room will require 30,000 cubic feet of gas per season at a cost of $13.50. Assume the total loss of the house to be 100,000 B.t.u. and the average winter heating gas consumption will be approximately 168,000 cubic feet at a cost of $75.60.

If your house has 20,000 cubic feet Chart No. 2 of Chart B shows you that the blower must deliver 1,332 c.f.m. to furnish 4 changes per hour.

DATA FOR USE IN ESTIMATING HEATING COSTS

Formula: $$\frac{\text{B.t.u. loss} \times \text{Degree Days} \times \text{Hours Daily Operation}}{\text{Temperature rise} \times \text{B.t.u. of gas} \times \text{Efficiency}} = \text{Cubic feet of gas.}$$

$$\therefore \quad \frac{1000 \times 3600 \times 24}{70 \times 1050 \times E} = \text{cubic feet per season of 3600 degree days per thousand B.t.u. heat loss —residence heated to 70° @ 0°.}$$

E equals over-all efficiency of installation. Do not use efficiency rating of appliance. For degree day seasons other than 3600, add or subtract percentage difference to or from total obtained.

Approximate gas consumption and cost of heating per 3600 degree day season per 1000 B.t.u. heat loss—1050 B.t.u. gas @ 45c per M.c.f.:

Efficiency	Gas Consumed Per 1000 B.t.u. Heat Loss	Gas Cost Per 1000 B.t.u. Heat Loss
30%—Very poor conversion	3,918 cu. ft.	$1.76
40%—Mediocre conversion	2,938 cu. ft.	1.32
50%—Standard conversion—good installation	2,351 cu. ft.	1.06
60%—Good conversion—Mediocre gas design	1,959 cu. ft.	.88
70%—Good gas design—gravity or radiator	1,677 cu. ft.	.75
80%—Excellent forced air gas design or gas fired unit heaters	1,469 cu. ft.	.66

Example: Residence with 118,000 B.t.u. loss—Standard conversion burner, good furnace installation, sufficient cold air returns, good rise for basement piping. Use 50% over-all efficiency.

118 × $1.06 = $125.08 cost of gas for normal season. This does not include gas for cooking and water heating.

The following shows the percentage of total degree days per season for each month in Tulsa:

September	.3%	October	4.4%	November	13.4%
December	21.5%	January	23.4%	February	17.8%
March	13.1%	April	5.1%	May	1.0%

Do not attempt to estimate gas cost by months as the meter reading month may vary from the calendar month and the individual year will vary from the average.

In case the estimated cost of gas for heating is over $200 per season the gas consumption for January will be over 100 M.c.f. and the 18c per M.c.f. rate will apply. Monthly percentage of degree days per season must then be used to determine the heating cost *per season.* In no event should the schedule of monthly cost be given to a customer although it is safe to say that the maximum bill per season will ordinarily amount to about one quarter of the total.

Note: District No. 13 December 1937—486 degree days; January 1938—873 DD; February 1938—736 DD; March 1938 DD.

District No. 3 December 1937—974 degree days; January 1938—777 DD; February 1938—626 DD; March 1938—551 DD.

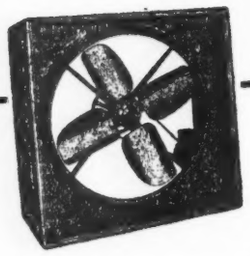
Example: Apartment house with 600,000 B.t.u. loss. Gas designed boiler—well balanced installation. Use 70% over-all efficiency. 600 × .75 = $450. This would be the heating cost if a flat rate of 45c per M.c.f. applied. Since the cost is over $200, use the cubc foot table and monthly percentage of season's degree days. 600 × 1677 = 1006 M.c.f. consumed per season.

September	3 M.c.f. @ 45c		$ 1.35
October	44 M.c.f. @ 45c		19.80
November	100 M.c.f. @ 45c & 35 M.c.f. @ 18c		51.30
December	100 M.c.f. @ 45c & 116 M.c.f. @ 18c		65.88
January	100 M.c.f. @ 45c	136 M.c.f. @ 18c	69.48
February	100 M.c.f. @ 45c	79 M.c.f. @ 18c	59.22
March	100 M.c.f. @ 45c	31 M.c.f. @ 18c	50.58
April	52 M.c.f. @ 45c		23.40
May	10 M.c.f. @ 45c		4.50
Total	609 M.c.f. @ 45c & 397 M.c.f. @ 18c		$345.51

See that the blower rating shows the minimum delivery at 1/8 inch static pressure plus pressure of filters at not over 500 r.p.m. to keep down noise.

Your heating Chart No. 4 can be used to check pipe sizes on your gravity jobs. That living room we mentioned as having 18,000 B.t.u. loss would require two 10 inch pipes with combined area of 156 square inches. Your return ducts should have a cross sectional area at the most restricted point at least equal to the combined cross sectional area of the warm air pipes. The return grills should have free area at least equal to the area of the duct and 10 per cent greater helps. Replacement of the old wood grills by metal ones will help most any installation since the free area of the wood grill is only 56 per cent while the metal grill will have free area up to 80 per cent. Never place

(*Continued on page* 120)



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Year	Units Sold
1937	110
1938	190
1939	250
1940	360
1941	180*
Total	1,090

*(As of July 15).

To accomplish this, a carefully worked out sales and advertising campaign was inaugurated. The advertising firm of Bozell & Jacobs, Inc., was retained as advertising counsel and it was decided that principal reliance for publicity purposes would be placed upon newspaper advertising. Besides this medium, some radio and bill-board advertising was used, but these latter two have been largely discontinued. Also employed are envelope stuffers, direct calls by salesmen, some telephone canvassing, publicity in the River Oaks Magazine, and in the Chamber of Commerce publication, "Houston."

As is the usual custom in Houston, an inspection is made of the prospect's premises, and a lump sum is quoted, covering both the cost of the fan, plus the installation costs.

No expense is spared by the firm in making first-class installations; the fan box is substantial, using Celotex, over a 2x2 frame; the box is full height both back and front, rather than a slanting box which decreases the size to save material. Quietness of operation is guaranteed by the liberal use of sponge rubber cushioning on which to set the fan; this sponge rubber base being standard equipment on the fans sold. The fans han-

Yours—For Years of Carefree Comfort

Home Heating and Air Conditioning . . .

An investment in the future worth of your home! Designed to give years of carefree service—and summer cooling can be added at will!

ASK YOUR ARCHITECT

Air Conditioning Company

3215 McKINNEY CAPITOL 9593

Shown is a group of three typical newspaper advertisements used by the Air Conditioning Company. An advertising agency prepares copy and checks results. Radio and billboard space have not proved as productive as newspapers.

The present staff of the Air Conditioning Company in front of the new building which has space for offices, display, warehousing, sheet metal shop. Five years ago the staff numbered five; today 36 persons are necessary for the service offered.

dled come equipped with thrust bearings on the end of the shaft, which permits the fan to be placed either in an upright position, or, should the space demand, it can be placed upon its face.

In the course of its many installations, some interesting jobs have been encountered. One of these is the air-cooling of the new auditorium at the St. Agnes Academy. Here, three Hunter fans, each of 20,300 c.f.m. capacity were employed, with the result that a delightfully cool auditorium is provided.

Special vibration dampeners were installed, and, so that none of the fans would drop, even in case of a fire, the fans are so installed that all the weight is carried by the roof structure above with none of the weight resting upon the floor. This precaution was taken to protect the delicate plaster ceiling of the auditorium itself.

Another interesting installation, and one which illustrates the versatility of attic fan installaton, was the air cooling job at the Cotton Hotel here. In this instance six Hunter fans of 18,000 c.f.m. capacity each were installed at strategic positions throughout the hotel, with the result that a satisfactory cooling job resulted.

The installation is so non-technical that, after the Air Conditioning Company had installed a sample layout, the hotel maintenance crew were able to install the other five fans themselves.

The fans in the Cotton Hotel were installed one fan to a floor and exhaust from guest rooms on that floor. A room was assigned for each fan and windows were removed so that the fans exhaust through openings formerly windows (see photograph). About 17 rooms are thus ventilated by each fan. The ventilation sequence is: guests open windows to admit air; air is pulled through the room, leaving above the corridor doors through openings formerly transoms; passes down the hall to the fan-room and out.

Air Conditioning Company is this year actively soliciting contracts to ventilate industrial and commercial buildings. Indicative of this effort is an installation yet to be made, awaiting completion of the building for a sale recently made to the Houston Ship Building Company. A total of 18

(*Continued on page* 130)

Cotton Hotel. Note center tier of openings, formerly windows, now enclosing fans.

BLOW AWAY YOUR HEAT TROUBLES WITH

★ HUNTER ★

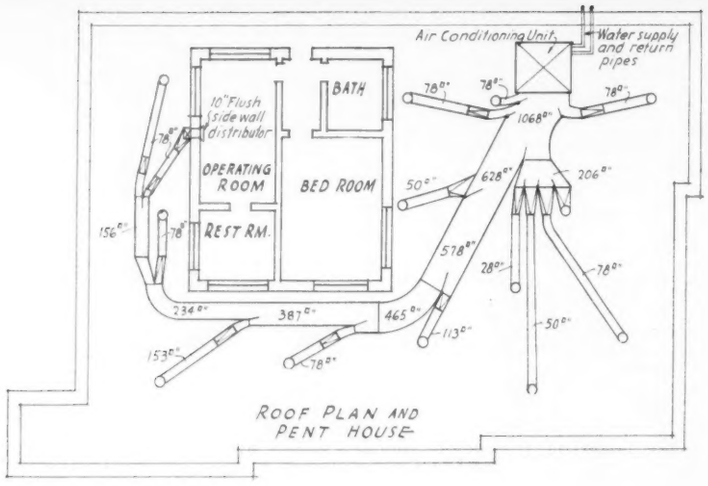
THE ATTIC FAN THAT GIVES MORE AIR VOLUME PER DOLLAR!

★ Special die-formed blades and a streamlined inlet mean more air volume per inch — and dollar! That's the principle behind Hunter Attic Fans! Investigate now, for a cool home this summer!

ASK YOUR ARCHITECT

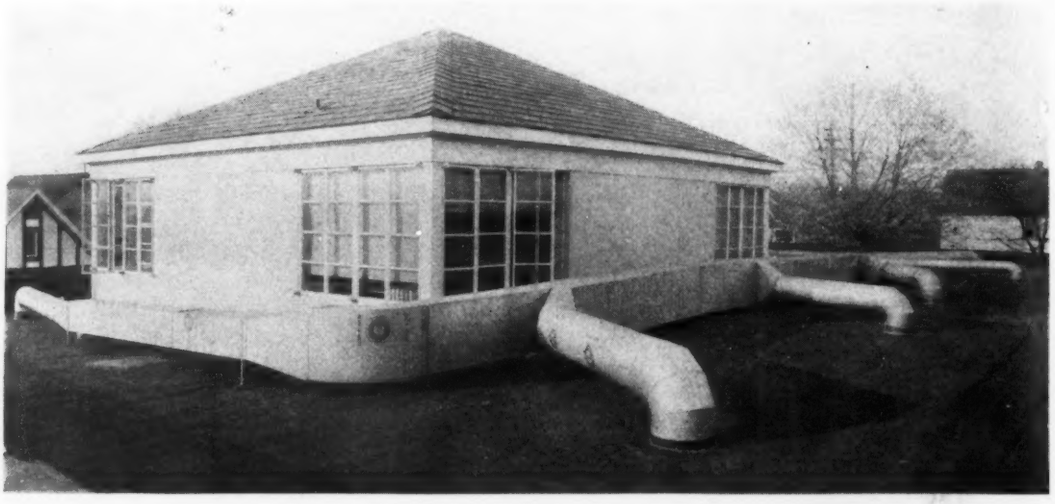
Air-Conditioning Company

3215 McKinney Capitol 9593



Roof Unit and Ducts, Ceiling Diffusers, Quiet Operation Feature an *Air Conditioning*

Above — Plan of duct system on roof encircling pent house. Right —The main duct is rectangular; branches are round pipe. Picture was taken before furred insulation described in text was applied.



THERE are several out-of-the-ordinary features in the animal hospital air conditioning system recently completed by Chas. Demuth & Sons, Garden City Park, L. I., N. Y., sheet metal contractors and manufacturers of air distributors. A brief summary of conditions and problems shows: 1—delivery of cool air without drafts; 2—prevention of sound transmission through ducts, especially in sick wards; 3—cooling; 4—odor removal; 5—inablity to install ducts within the building due to low ceilings and unwillingness of the owner to sacrifice headroom; 6—insulation of roof-located ducts.

An additional factor was the owner requirement that work proceed without interference with the normal functions of the hospital and with a minimum of structure cutting. Considering these conditions the obvious solution was a duct running over the roof, for this is a one-story and pent house structure.

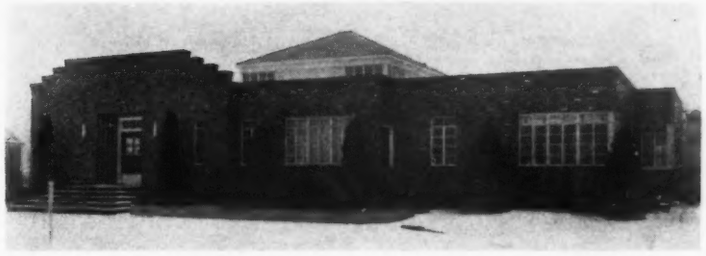
Rooms on the first floor include: reception, office, technical and pharmacy, examination, x-ray, corridor, five wards, examination (No. 2) and, in the pent house on the second floor, operating and rest rooms. In the new cooling layout all the foregoing rooms are treated except the rest room. Thus 13 of the total 14 rooms are now cooled and ventilated.

As might be suspected, sick animals, like sick persons, are readily susceptible to drafts although, being primarily outdoor creatures, animals' fresh air need is vital. To provide the required air without drafts the contractors installed Demuth air distributors. These were centrally placed in ceilings in all instances except the operating room, where wall placement was preferred by the doctor-owner because he had a large, high-candle-power lamp over a central operating table and did not wish the lighting disturbed.

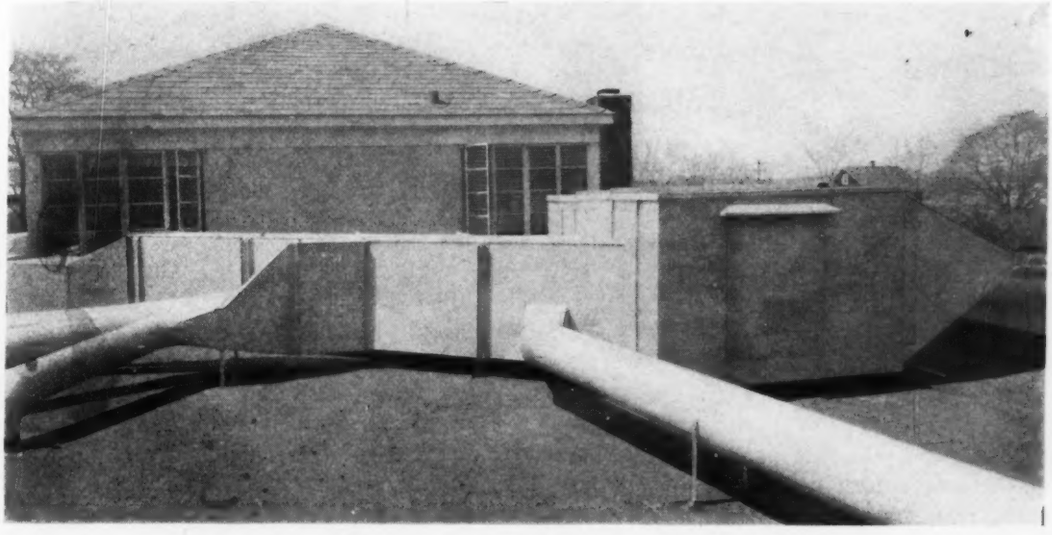
The selection of air distributors as duct termini requires consideration of room size; cubic contents as reflected in quantity of air to be delivered; air velocity in the branch duct and at the neck of the distributor. Reference to manufacturers' tables should reveal the proper size distributors needed under the foregoing working conditions.

Air velocity in the ducts of this system was estimated at 1,200 feet per minute. When this plant is used as a cooling system about a 15-minute air change is anticipated. When used solely

By R. C. Nason



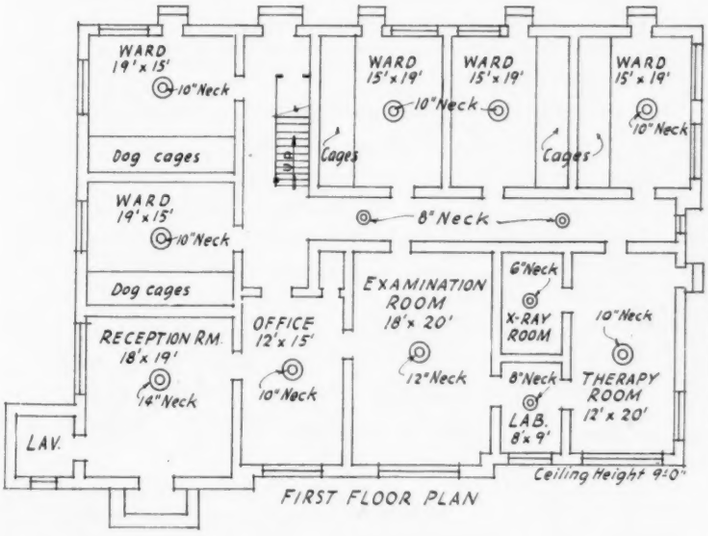
System in an Animal Hospital



Above—The animal hospital is an attractive building. Left—Part of duct system at the equipment housing. Housing contains blower, cooling coil and filters. Air intake is in lower face of triangular end section.

for ventilation, a 9-minute change was figured. The former requires 5,000 cu. ft. per minute, while 8,000 cu. ft. per minute was estimated for ventilation in which case the fan inlet door is fully open.

Room sizes are shown on an accompanying drawing and call for air distributors of the following sizes for the following rooms: reception, 14-in. (combined, indirect lighting type); office, 10-in. (lighting type); main examination, 12-in. (plain); technical and pharmacy, 8-in. (lighting type); examination, No. 2, 10-in.; X-ray, 6-in.; operating, 8-in. sidewall type; halls, two, 8-in. (lighting type); 5 wards, 10-in., one in each. Total 14 distributors.



As mentioned earlier the sheet metal contractor placed his ducts on the roof, which, of course, mean ceiling cutting. Room centers were found by the usual course of diagonal lining, dropping a bob from ceiling to cross point. Ceiling openings then were cut with an augur drill supplemented with a hole saw.

Existing roof surface was asphalt over wood sheathing. To prepare openings for branch ducts, the first step was spreading a layer of roofing cement on the sheathing around the holes, for setting 24-oz. copper flanged collars. Flanges were 6-in. and, when set, were nailed to sheathing on 1-in. centers.

The next step was placing within the copper flanges from below galvanized steel thimbles, which overlapped the copper flanges generously and were nailed to sheathing with three 6-penny nails. Distributors were first bolted to supporting rings within hole thimbles. Distributors then were attached to cross-straps within a supporting ring which had previously been bolted

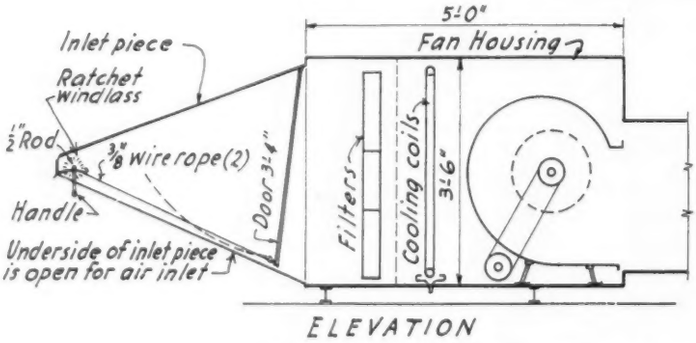
Demuth air diffusers placed in center of ceiling were carefully selected so that dispersion and velocity are draftless, but uniform throughout rooms.

within hole thimbles. This is an exclusive Demuth procedure.

After the copper flanges were set they were flashed to roofing with several layers of roofing cement, covering nail heads well. As roof branch ducts were horizontal, the contractors had to join to the flange by slipping over the vertical necks of the flanges galvanized steel elbows, previously having applied plastic to the copper at overlap joints for weathertightness and sealing against air loss.

Duct branches, varying from 3 ft. to 12 ft. in length, were joined to a rectangular trunk by square to round transitions with interior splitters as shown in accompanying illustrations. Having tried numerous methods, the senior partner of this firm favors this method especially when ceiling-installed air distributors are to be employed.

The fan housing, with accompanying cooling coil and filter sections, is 5 ft. deep by 5 ft. wide by 3 ft. 6 in. high. Neither the unit nor ducts were set directly on the roof in any instance, but were raised 8 in. above the surface. Position fixation is by roof-anchored steel bands and angle irons. Sides and roof of the housing are standing seam.



Sketch of fan-filter-coil housing showing air intake and ratchet adjusted intake door. With door fully open and fan idle the installation becomes a gravity exhaust system.

Within the part of the housing nearest the trunk duct is a belted fan and motor; next in line towards the air supply intake is a fin-tube type cooling coil for reception of street main water. Next in line is a single bank of vertical "throw-away" filters comprising 6 sections each 16 in. by 25 in. These are set in a steel frame to facilitate removal and replacement.

Beneath the coils is a drip pan and weephole. In one end of the filter compartment is a ring for pulling out the filters. Air inlet into the system is via a triangular-shaped section folded into the roof of the filter compartment. The upper side of the inlet, being sloping, provides shade while resisting inclement weather and dust. The under side is open to the roof and so made as to permit manipulation of an internal "flap" door that may be manipulated to regulate air supply volume.

A ratchet type windlass, attached to the side of the inlet piece raises or lowers the flap door, thereby changing the size of the air opening. Movement of the door is effected by wire ropes attached one at each end, to the door. The rope is, again, attached to a ½-in. rod set in a plain socket at one end and attached to the ratchet at its other end. Movement of the handle winds or unwinds the wire ropes onto the rod and thus opens

(*Continued on page* 114)

Houston Lighting & Power Co. Suggests These

Attic Fan Installation Details

Houston Lighting and Power Company, Houston, Texas, whose motto is "Service First" has an attic fan-ventilating manual titled—"Residential, Commercial and Industrial Ventilation Installation" which contains much valuable information. Much of the technical material parallels Bulletin 52 of Texas Agricultural and Mechanical College (publication just concluded) but the Houston Lighting manual also has material which we publish here in the interest of ventilation literature. Material is reprinted by permission.

MUCH has been published on the subject of adequate and proper areas of exhaust, intake and other openings for a fan system. The Houston Lighting & Power Co. manual gathers all this material into a single table which makes selection of opening according to the type grille material used a simple matter of selection by air volume moved in the system. This table is shown. A point of particular interest to the editors is the serious effect of screening on opening capacity.

Note: The last two columns have been revised and enlarged and are on page 70. Use the two tables together.

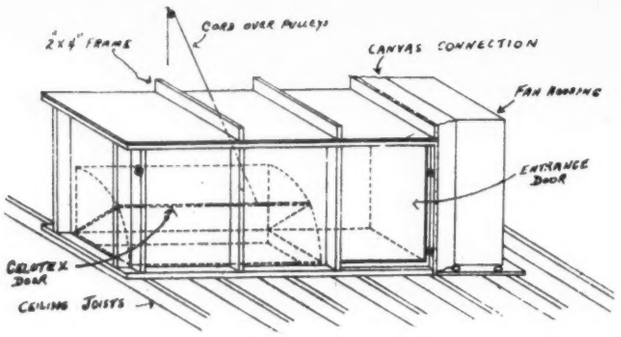
TABLE OF MINIMUM RECOMMENDED EXHAUST OPENINGS, LOUVERS, AND GRILLES IN SQUARE FEET FOR VARIOUS METHODS OF INTAKE AND DISCHARGE

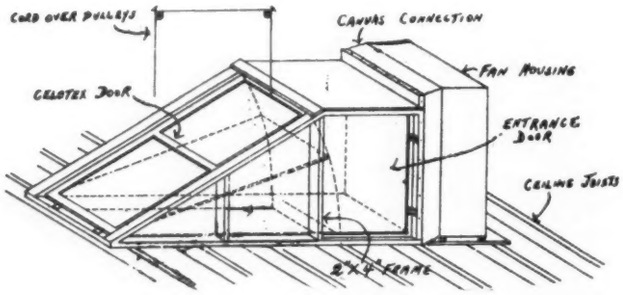
Grille area based on velocity through grille of 750 feet per minute maximum.

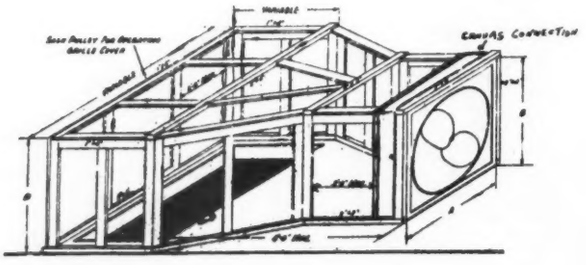
Unit Capacity CFM	Porch Ceiling Grille Unscreened	Soffit Boards Unscreened	Metal Louvers Unscreened	Wooden Louvers Unscreened	Dormer Windows Unscreened	Porch Ceiling Grille Screened	Soffit Boards Screened	Metal Louvers Screened	Wooden Louvers Screened	Dormer Windows Screened
3,000	5	5	6.3	10	5	10	10	12.6	20	10
4,000	6.7	6.7	8.3	13.4	6.7	13.5	13.5	16.6	27	13.5
5,000	8.3	8.3	10.4	16.6	8.3	16.6	16.6	21	33	16.6
6,000	10	10	12.5	20	10	20	20	25	40	20
7,000	12.6	12.6	15	25	12.6	25	25	30	50	25
8,000	13.6	13.6	17	27	13.6	27	27	34	54	27
9,000	15	15	18.7	30	15	30	30	37.5	60	30
10,000	16.6	16.6	22	34	16.6	33	33	44	68	33
11,000	18.3	18.3	22.8	36.6	18.3	36.6	36.6	45.6	73	36.6
12,000	20	20	25	40	20	40	40	50	80	40
13,000	21.6	21.6	27	43	21.6	43	43	54	86	43
14,000	23.3	23.3	29	46.6	23.3	46.6	46.6	58	93	46.6
15,000	25	25	31	50	25	50	50	62	100	50
16,000	26.6	26.6	33	53	26.6	53	53	66	106	53
17,000	28.3	28.3	35.4	56.6	28.3	56.6	56.6	71	113	56.6
18,000	30	30	37.5	60	30	60	60	75	120	60
19,000	32	32	40	64	32	64	64	80	128	64
20,000	33.3	33.3	41.6	66.6	33.3	66.6	66.6	83	133	66.6
21,000	35	35	44	70	35	70	70	88	140	70
22,000	37	37	48	74	37	74	74	96	148	74
23,000	38.3	38.3	47.8	76.6	38.3	76.6	76.6	95.6	153	76.6
24,000	40	40	50	80	40	80	80	100	160	80
25,000	42	42	55	84	42	84	84	110	168	84

Suction Boxes

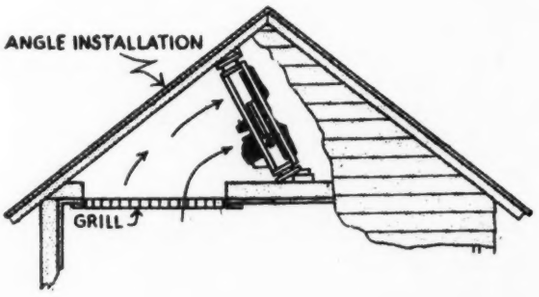
In the dozens of articles on attic fan installation published in AMERICAN ARTISAN since 1933, the problem of proper suction box design has been treated exhaustively. But Houston Lighting & Power Co. manual shows three types of boxes not previously been shown. There are excellent reasons behind these three boxes. For example, Fig. 1 shows a rectangular fire door hinged on







Left, top—Fig. 1—Fan housing for long grille with simple, rectangular fire door. Left, center—Fig. 2—Economical housing with slanted top over grille to reduce material used. Left bottom—Fig. 3—Housing for long grille where fan must be placed parallel to long axis of box. Fan in all housings is at least one diameter away from closest grille edge. Below—Fig. 4—Low attics can employ the slanted fan as shown if fan bearings will take thrust as well as load.



the longest side which should find many uses. The fusible link in the door pull rope is combined with a circuit breaker which opens when the door closes.

Fig. 2 shows a box with sloping rear which saves material, yet possesses excellent resistance characteristics according to Houston installers. Fig. 3 shows a box for a long and narrow hall where the grille is long and narrow and because of a low attic the fan has to be placed parallel to the long side of the grille.

An adaptation of Fig. 2 box, but wider, is suggested for twin fan mountings. A full baffle should be installed through the center of the tunnel from fan to rear between grilles so that one fan may run alone.

Insulation of Attics

The Houston Lighting & Power Co. manual says with respect to attic insulation: "The temperature in an insulated house is lower than it is in an un-insulated house; for this reason many people are under the impression that mechanical cooling is superfluous in an insulated house. But insulation alone does not remove the stale, stuffy air that accumulates in the attic, nor does it bring in cooling breezes through the house after the sun goes down. However, the combination of attic ventilation and insulation is ideal and more efficient results will be obtained when the two are used together."

Fans for Flat Roofs

For the small house with a low-pitched roof the tilted fan shown in Fig. 4 is suggested. The caution is to be sure the fan has shaft thrust bearings to take the load.

For absolutely flat roofs Houston manual suggests a careful inspection of the roof for any weakness before the opening is cut or the fan mounted. After the dimensions and location have been determined, the opening can be cut and a base of 2 by 4 material built as a curb; also build a platform for the fan rest and be sure the plat-

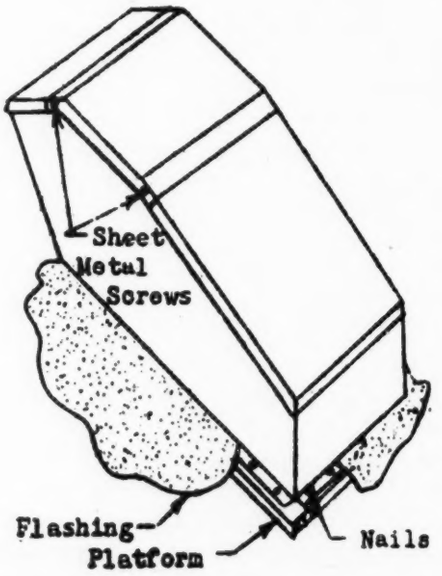


Fig. 5—A curb platform as shown over which the housing fits and with adequate flashing between curb face and housing insures weather tightness. Tar paper lining in the housing will also prevent condensation.

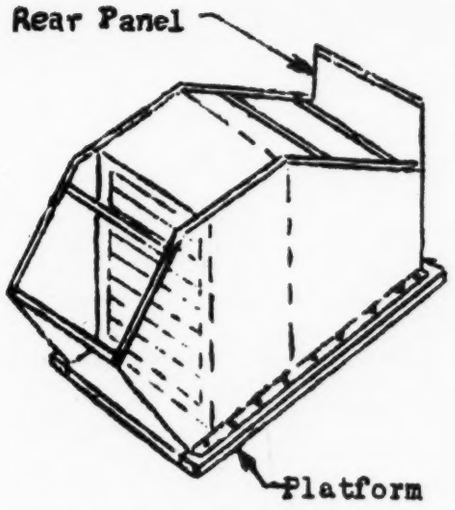


Fig. 6—A fan face hood like this keeps rain from coming through the fan and keeps a direct wind from reducing fan exhaust.

form is level (the roof may slope). The platform should be placed so that the fan back is to the direction of prevailing winds.

For a weather-tight housing make the casing of metal with a weather-resistant coating. Use metal flashing applied to the full base; wide enough to overlap the flange on the housing and to cover a few inches of the roof as shown in Fig. 5. Fasten the flashing in place with roofing nails and tar around the edges; also tar the sides of the rear slip-joint. It is also well to line the inside of the suction box with tar paper or asbestos to prevent condensation. Care should be used properly to slant the hood to protect the fan from rain and to prevent rain from running through the fan blades to the ceiling grille. See Fig 6.

Tourist Court Intallations

The Houston manual reminds us that: Attic ventilation is rapidly becoming the number 1 requirement with tourist court apartment owners. Ordinarily one fan is installed to serve two or three apartments as shown in Fig. 7. Usually a control switch is so located that the fan can be operated by a building attendant.

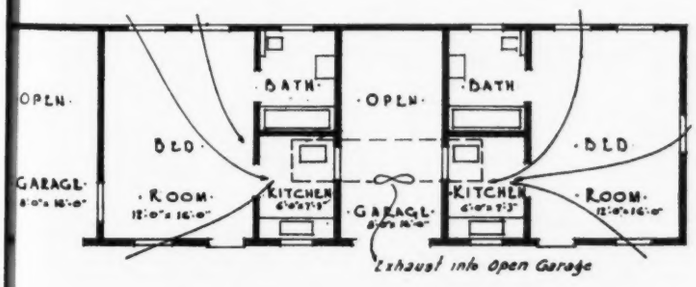


Fig. 7—The row-type tourist home can be ventilated by placing the fan between buildings to serve two houses. Let the switch be operated by an attendant (not by the tourist) is advised.

Selecting Fan Capacity

A common mistake, says the manual, in commercial as well as residential ventilation is the selection of a fan too small or an insufficient number of fans for the space to be cooled. The manual suggests fan selection on the basis of the following table:

Establishment	Suggested Air Changes
Restaurants	1 A.C. per min.
Retail Stores	1 A.C. per min.
Theatres	1 A.C. per min.
Lodge Halls	1½ A.C. per min.
Assembly Halls	1 A.C. per min.
Bakeries	1 A.C. per min.
Bowling Alleys	1 A.C. per min.
Churches	1 A.C. per min.
Dance Halls	1½ A.C. per min.
Garages	1/3 A.C. per min.
Laundries	1 A.C. per min.
Offices	1 A.C. per min.

Commercial Cooling Requires Air Movement

This bit of advice is worth study—"To obtain the best results from commercial ventilating systems used primarily during the day, it is necessary to combine the effect of ventilation with turbulent air. This is necessary for several reasons. The air being moved during the day is much warmer than night air; therefore, evaporation must be speeded up by increased air movement to produce the necessary cooling effect. At the same time, the air which has remained in the shade for a short interval is cooler than air which has just been brought in from outside. If the

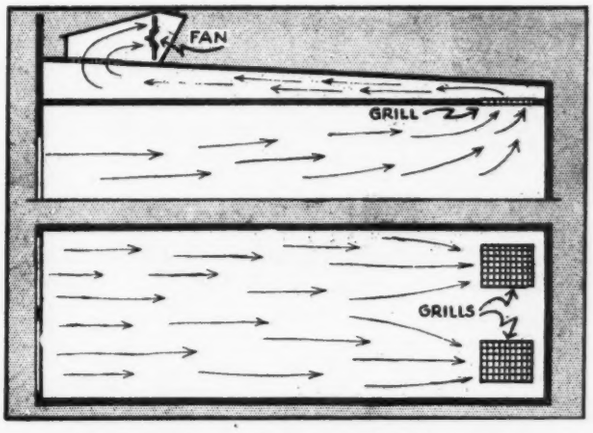


Fig. 8—In low, tight, commercial attics the fan in one end and the grille in the other sweeps out attic air with room air. But the attic must be tight.

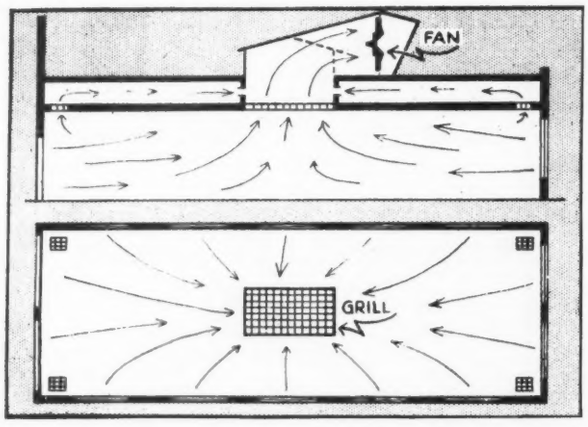


Fig. 9—Where owners insist on open windows, the central fan probably is best adapted to meet all conditions. The attic can be ventilated as shown or blocked off.

fans are located to blow along the longest dimension of the room or to sweep the air in through one set of openings and out a facing set, the turbulence will be secured."

Commercial Roof Intallations

Where the ceiling is low and attic is tight, the application shown in Fig. 8 has excellent characteristics. Here the attic is tight enough to serve as a suction chamber. Ceiling grilles are located at the rear and the fan is placed in a penthouse

Grilles (Net Free Opening)

Unit Capacity CFM	63% ¾" No. 16 Shelf X	70% Inter-Locking Wood	75% Inter-Locking Wood	80% ¾" No. 13 Safe-T-Mesh	85% ¾" No. 16 Safe-T-Mesh
3,000	6.3	5.5	5.3	5.	4.7
4,000	8.4	7.5	7.1	6.7	6.3
5,000	10.6	9.5	8.9	8.3	7.8
6,000	12.7	11.3	10.7	10.	9.4
7,000	14.8	13.3	12.4	11.7	11.
8,000	16.9	15.2	14.2	13.6	12.5
9,000	19.0	17.1	16.	15.	14.
10,000	21.1	19.	17.7	16.6	15.6
11,000	23.2	20.8	19.4	18.3	17.1
12,000	25.4	22.8	21.4	20.	18.8
13,000	27.5	24.7	23.1	21.6	20.
14,000	29.6	26.5	24.9	23.3	21.9
15,000	31.7	28.5	26.7	25.	23.5
16,000	33.8	30.4	28.5	26.6	25.
17,000	35.9	32.3	30.5	28.3	26.6
18,000	38.	34.3	32.	30.	28.2
19,000	40.	36.1	33.7	31.6	29.7
20,000	42.	38.	35.4	33.3	31.3
21,000	44.3	40.	37.3	35.	33.
22,000	46.5	41.8	39.	37.	34.2
23,000	48.5	43.7	40.	38.3	36.
24,000	50.8	45.7	42.6	40.	37.6
25,000	53.	47.5	44.4	42.	39.1

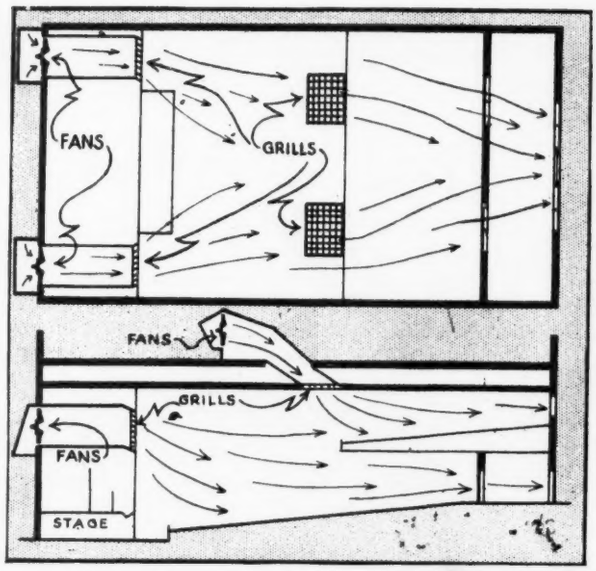


Fig. 10—Blow-in systems are often advisable particularly in spaces like theatres. These systems set up high air turbulence and noticeable air movement. Air escapes through doors and windows.

near the front of the store. Moving air sweeps out attic heat as it passes from grilles to roof opening. If the attic cannot be made tight the penthouse should be located at the rear and connected directly to ceiling grilles.

When it is known beforehand that openings on all sides of the room or building will be kept open, it is best to place the grille in the center as shown in Fig. 9. Frequently the fan mounting or penthouse can be adapted to an existing skylight. This type of installation, says the manual, requires two to four times the fan capacity needed in the installation in Fig. 8.

Use of blow in ventilation is sometimes excellent for theatres. Fig. 10 shows fans installed in the back wall to blow in through grilles on each side of the stage. Fans may also be placed in side walls or on the roof with ducts connecting with the grille on each side of the stage. If the theatre is long or if there is a balcony, one or more additional fans should be placed on the roof to blow in through ceiling grilles placed just in front of the balcony. The air in blow-in systems passes out through grilles, louvres, entrance doors, etc.

The material shown in this article constitutes only a small part of the text and illustrations in the manual. Houston Lighting & Power Co. wishes readers to know that the manual was published for the company's own use only and the company cannot be responsible for any errors.

SHEET METAL SECTION

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

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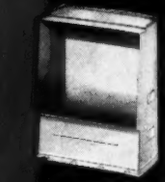
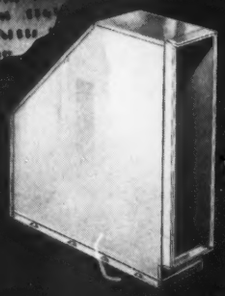
H-27



First Floor Baseboard H

End Boot



Vertical Elbow

Universal Boot

45° Angle

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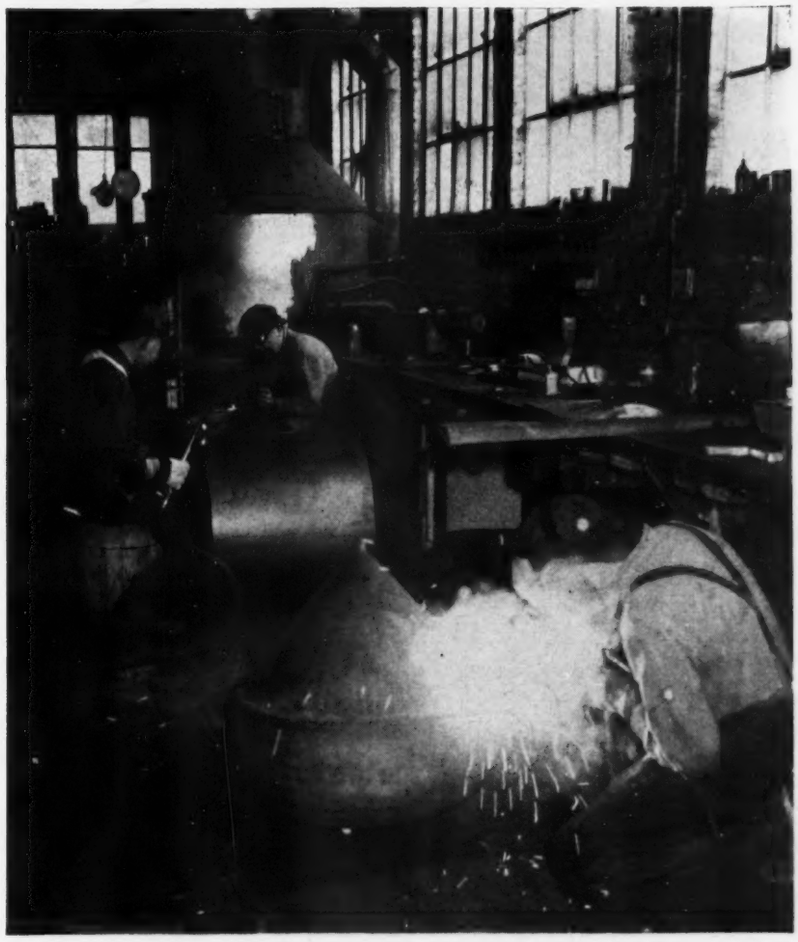
Gundlach in Sandusky, O. Definitely Invites

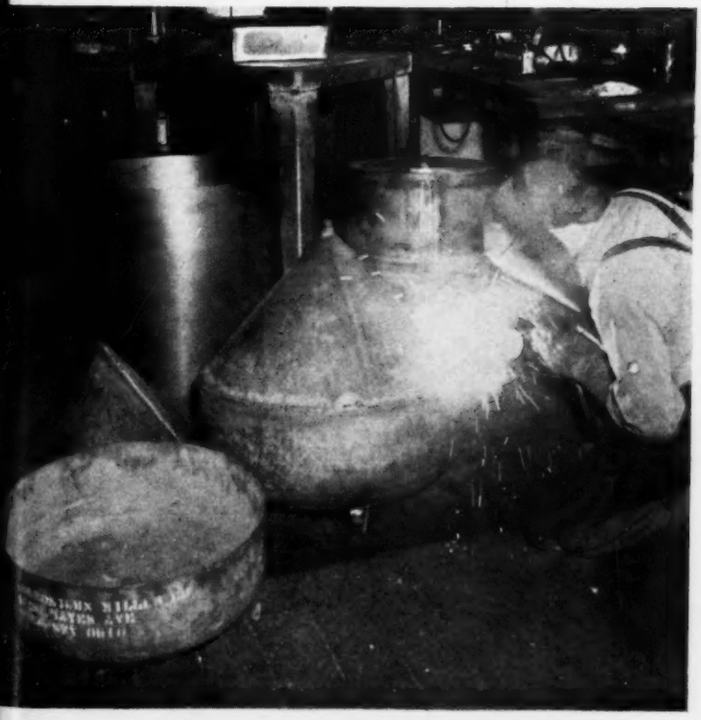
Heavy Gauge Specialties

GUNDLACH SHEET METAL COMPANY of Sandusky, Ohio, fabricates for other manufacturers an interesting line of heavy gauge specialties which require power equipment, all kinds of welding and a specialized technique which has been painstakingly worked out through 52 years of experience.

These specialties include a round bottom, cone top pressure tank of 8-gauge used in engine oil reclaiming machines; gasoline tanks of 20 and 22-gauge galvanized iron for a boat builder; material buckets of 14-gauge black iron used in processing; air tight cylindrical vacuum tanks of 10 and 12-gauge for oil processing. All of these items are regularly fabricated in large quantities.



Electric arc and gas welding are employed in the Gundlach shop in fabricating pressure tanks (foreground) and cylinders. A closer view of the pressure tank, showing the purchased bottom and two cone pieces, appears below. Bronze rod is used with the torch.



In addition, the shop does a sizable volume in fabricating other "occasional" specialties such as snap plates, dust collectors, ventilators, hoppers, accessories for material collecting and fume removal systems—all of which are pretty much standard specifications and made for regular customers.

These specialties require power shears, rolls, brakes; also spot, gas and electric welding equipment of high capacity; and, of much importance, fabricating ability to devise piece shapes and sizes which can be readily handled plus special jigs and fixtures for all standardized items. The necessary fabricating ability and technique is best illustrated by a brief description of the methods applied to the several items shown in the photographs.

Pressure Tanks and Cylinders

The round bottom, cone top pressure tank of 8-gauge consists of a purchased pressed bottom (see photograph) and two-cone pieces cut and rolled in the Gundlach shop. The two pieces of the cone are placed in a fixture and butt welded electrically after which the complete cone is electrically welded to the bottom. The tank must

The oil machine cylinders have a larger bottom section than top, so a fill-in collar is torch welded with bronze rod to top and bottom. These tanks must be pressure tight. Several hundred are made each year.

withstand a pressure of 450 pounds per square inch and be air tight so good welding is essential.

The cylindrical tanks of 10 and 12-gauge are double decked with the larger cylinder on the bottom (see photograph) and require two cylindrically rolled sides, a collar to join top to bottom, a bottom and a top with fittings. The sides are sheared and rolled by power and gas butt welded (bronze rod). Then the collar is welded to top and bottom and the top and bottom gas welded in place. These cylinders must be true in shape so special fixtures are used to hold pieces true while being welded. The fixtures are bronze welded to the top before assembly. One photograph shows pressure tanks and cylinders being welded during assembly.

Gasoline Tanks

Boat gasoline tanks are made in ten sizes and must, of course, be air tight. The largest tank is rectangular in shape (see photograph) of 20-gauge galvanized iron and is spot welded and soldered. Each tank consists of two side pieces (two sides each) and two ends. The splash partitions are spot welded inside before ends are applied and need not be air tight.

The smaller tanks of 22-gauge galvanized iron are triangular in shape (see photograph) and are built up of four sides and two ends joined by standing seams spot welded and soldered.

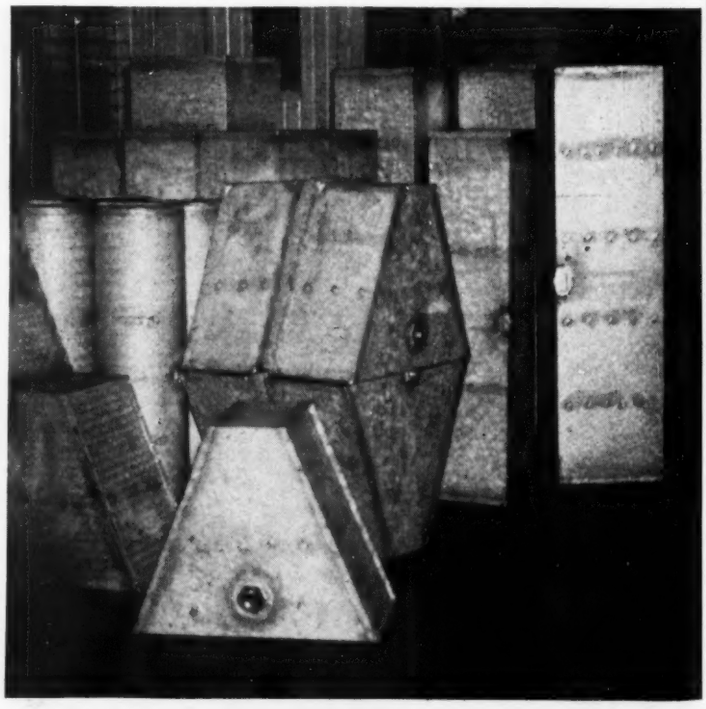
Filler, vent and drain fixtures are bronze gas welded in place in the pieces before assembly.

Buckets

The buckets shown in a photograph are built of 14 gauge black iron and are not water tight. The buckets are four sided rectangular and consist of three pieces—two sides and the bottom. To facilitate fabrication, one side piece forms three sides of the bucket (two bends in the brake) with two turned in edges to which the second side piece is spot welded. The photograph shows these spot welds clearly. The bottom has four turned down edges and is inserted in the assembled sides and spot welded through the edges. The bucket, therefore, rests on four edges with the bottom proper off the floor. The top edges are turned out and down to form a channel into which a formed bar is inserted for stiffening. Then the two edge flanges and the bar are spot welded through to hold the bar in place. Bale brackets are spot welded to the sides.

"Occasional" Specialties

When the photographs of the above standard items were being taken, Gundlach Sheet Metal had in production a large order of all copper ven-



Boat gasoline tanks in several sizes are in constant production. The spot welder is used to fasten pieces after which the joints are soldered. The "tacks" hold the splash partitions in position.

Above—Buckets, as made by Gunlach, are built of three pieces—two sides (one side piece forms three sides) and the bottom. Spot welding along standing edges holds the pieces together.

tilators of storm band type with square bases. These ventilators were fabricated by spot welding and illustrate how Gundlach applies their techniques of welding to "occasional" specialties.

Ventilator parts consist of the cone top, storm band, storm band brackets, neck, round to square transition section and the square base. The cone is one piece spot welded; the storm band is one piece beaded and spot welded; the neck is made the same way. The transition was made in one piece by the usual round to rectangular pattern and is spot welded to the base. The base was soldered along mitres and double hemmed (turned out) for the base flange.

The spot welding of copper without burning the metal and to insure a permanent weld, Gundlach has found, can be a tricky operation unless the characteristics of the material are fully understood. Copper, of course, has a high thermal and electrical conductivity. Very high electrical energy values of the order of 200 KVA applied in short heat-on periods (perhaps $\frac{1}{120}$ second) are required. Roughly, the Gundlach setup is equivalent to the setup for spot welding two $\frac{3}{16}$-inch blanks.

Firm History

There is an interesting story behind the operations of this firm. The shop was started by the father of the present three brothers in 1889 as a general store handling stoves, furnaces, garden tools and miscellaneous hardware items. At one

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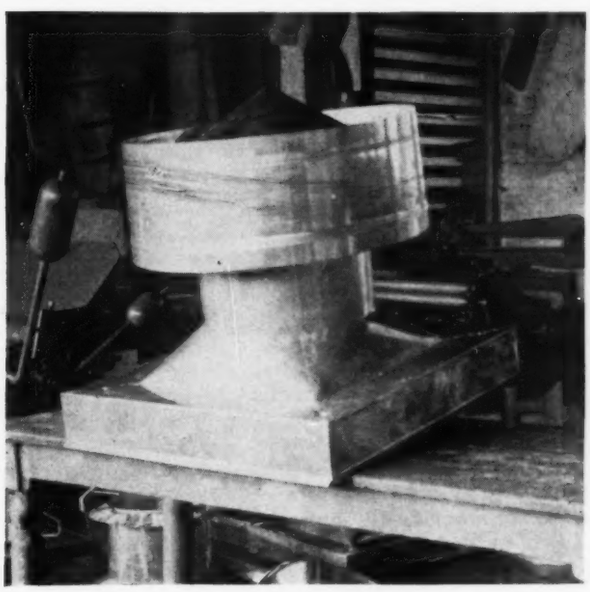
Below—Copper ventilators, recently made, are put together by spot welding. Spot welding of copper is successfully done by Gundlach in spite of its difficulties. Parts of the ventilators are shown left; a finished ventilator is shown right.



Gundlach mechanic spot welding copper ventilator parts. High KVA in short heat on periods (set-up equivalent to spot welding two $\frac{1}{8}$-in. iron pieces) does the trick on copper.

time the firm had the largest trade in furnaces and roofing in Sandusky with some 2800 names of steady customers in its files. Competition year by year whittled this list away until eventually the firm looked elsewhere for sources of work to keep a large well-equipped shop operating.

This seeking for work led to the first cautious trials at manufacturing items for local concerns which did not have the sheet metal equipment or experience to do good work as cheaply as Gundlach could do it. This specialty manufacturing grew slowly; but eventually it became apparent that there was a place in the Sandusky trade area for a shop which could fabricate items in gauges too heavy for the average shop to handle. Power equipment was bought, welding was added and mastered, techniques were worked out and manufacturing was under way.

The pressure tanks and cylindrical tanks were "taken on" in a small way about eight years ago. Year by year the volume of these items has expanded. The gasoline tanks were first tried about seven years ago and now are in steady production. Buckets and containers and other specialties were added from time to time until now, furnace heating constitutes approximately 10 per cent and outside sheet metal and repair work 15 per cent of the Gundlach volume. The rest is manufacturing.

Gundlach Sheet Metal Company has been a union shop for many years and the higher scale has made new house and repair work practically impossible except for the occasional customer. Carl M. Gundlach (long time officer of the Ohio Sheet Metal Contractors Association), runs the office. costs, customer contact, etc., while brother Edward is shop superintendent and Harold oversees all outside work.

Procedure For Assigning Priority Ratings

THE definitions of the new classifications are:

A. Orders for *a product* which is to enter directly or indirectly into the manufacture of any material for the Army or Navy, or in the defense of the British Empire (hereinafter called "Defense Orders"). This "A" classification applies to all defense orders whether or not a specific defense priority rating has been obtained. If you have a specific defense priority rating, such as A-1, A-2, A-3, etc., it should be indicated on the order.

B-1 Orders for *a product* for the manufacture of apparatus, equipment and devices (including parts) used directly or indirectly in connection with the manufacture of material which enters in substantial quantity into the fulfillment of Defense Orders.

B-2 Orders for *a product* for the manufacture of parts for the repair or replacement of existing apparatus, equipment and devices which must continue to operate in order to preserve essential production and services.

B-3 Orders for *a product* for the manufacture of new apparatus, equipment and devices used directly in operations which must continue in order to preserve essential production and services.

B-4 Orders for products essential to the protection of public health or safety.

B-5 This classification will not be used pending further investigation.

B-6 This classification applies to cases where your use of *a product* does not exceed two pounds per hundred dollars of final sales value of the article or articles produced by you, of which the product is an essential component.

B-7 For *a product* used in products in which no reasonably satisfactory substitute for the product is available.

B-8 For *a product* used in products in which a reasonably satisfactory substitute for the product is available or can be made available.

NOTE: Any specified order for a use shown from

(*Continued on page* 114)

Shearing and Cutting Instruction in

"Streamlined" Sheet Metal Training

By Ernest E. Zideck

Instructor, Technical School, Jackson, Michigan

THE operation of the shears and cutters by which pieces of metal are obtained for further processing has been regarded as a subordinate, common labor performance. This attitude may have had its justification in the fact that the blanks sheared or cut underwent another operation prior to their provisioning and forming, that of *marking*. A pattern or a strip of metal carefully prepared with prickpunch marks for each dimension was clamped down over each separate blank and the markings were transferred to the metal piece to be sheared. A slight divergence in the sizes of the pieces so marked was absorbed in the laps, with the markings for holes and brakes still remaining uniformly placed.

The marking method is adhered to, and is less costly, if only a few identical parts are manufactured at a time; the time consumed in the dimensioning and marking of the several pieces being less than it would take to set the gauges; or, if no means are available for doing the work by gauge-set-up.

Marking Method Procedure

In shops not having punch presses by which notching and other related die work can be done, and having no brakes for formations by gauge-set-ups, the marking method must be employed, the pattern or the marking strip being used. In this connection it has been a common practice to take several identical pieces at a time, clamp the pattern tight over the pile and do the marking through a number of the sheets simultaneously. This same method may be used to advantage in drilling holes. Sheets may be clamped together and the holes drilled through all of them, with one sheet only, the uppermost one, having been marked for drilling.

In absence of a punch press by which *notching* and other such provisioning may be done by gauge-set-up, the marking method and notching by hand is the alternative. The preparation of the blanks in this manner takes up much time and is not always correctly done. Neither is the braking-forming by markings an easy or a quick operation, with the worker or workers on the brake searching for the right dot on which to brake, the dot tending to make the metal slide away from the braking blade, the parts so formed showing unavoidable variations in dimensions.

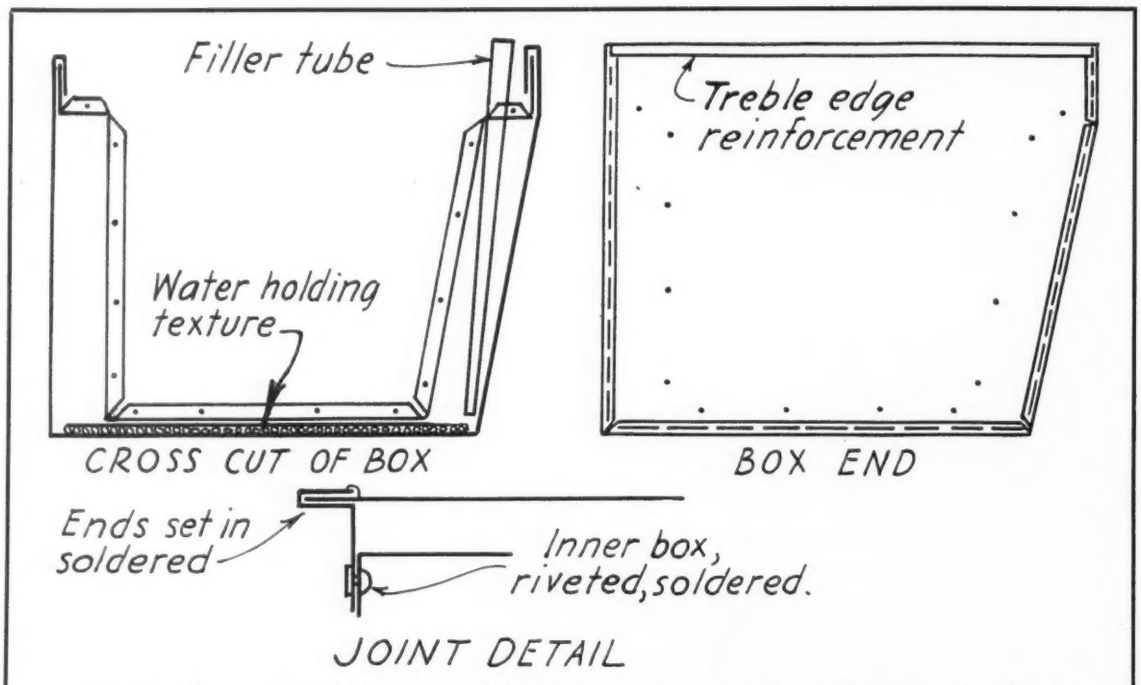
It is evident from the above that, in the manufacture of a greater number of identical parts than, possibly, twelve, the dependence of the worker on the marking method and doing the notching and forming by marks must result in inferior output at a prohibitive cost. In the making of common tinware, pipe, gutters, skylights and diverse other multiple-parts construction, for instance, the poorly equipped sheet metal shop has ceased to be able to compete with factory-made goods.

"Factory" Methods Necessitate Machines

These conditions make it imperative for the instructor in sheet metal work to deviate from the time-honored course of instruction given the students and adapt his instruction to up-to-date demands in the trade. The most crying need in the sheet metal shop is for modernization of equipment; and the training of workers for work as is being done by means of modern, yet so modest, equipment.

The squaring shears operated by foot, if it will cut at all and shear up to 16 gauge, is capable of turning out a vast number of blanks; a small punch press to do the notching-provisioning in the blanks will prove a great help; a brake which may be operated by gauge-set-up, and a spot welder, will largely complete the modernization of equipment in the small shop, rendering the shop capable of doing work by time-saving, more efficient standards.

Aside from work being done exclusively by dies in *mass* production, sheet metal work in factories making items not exceeding fifty thousand identical units still must be done by the same methods which apply in the modern sheet metal shop. These factories must shear and cut the blanks



A flower box made of sheet metal for placement on window sill or porch; the box having double walls and bottoms for holding a supply of water in the space between the walls; the inner bottom having a series of small holes connecting to moisture transmitting texture placed in between the bottoms; the box filled with soil which presses the two bottoms together, the action compressing the cotton or similar fabric preventing water flowing into the soil, but allowing for the roots of the plants obtaining moisture from the wet cloth as needed.

The drawing shows the construction of the double trough. The inner one is provided with flanges over which reposes the set-in end of the box. The ends may be riveted to the flanges and soldered, and soldering is done also along the edges of the set-in ends, making the box watertight.

These boxes present a meritorious item for students in a sheet metal class to practice quantity work, there being layout work, shearing, provisioning in flat, braking-forming, fitting, riveting, end-seaming possibly, and soldering to be done.

same as the shop would; they employ small punch presses for notching-provisioning; they brake and form by gauge-set-up. These operations, the preparation of blanks, their provisioning and forming to shape, constitute two-thirds of work required to produce the item, be the item large or small, a heater cabinet, a radiator guard, a locker, a waste receptacle or what-not.

Therefore, in the production of the hundreds of utensils which our sheet metal fabricating establishments have brought forth and which confront us everywhere we look, and which the uninitiated call "factory goods" (meaning goods produced "en masse," like automobiles), no other methods of working sheet metal are applied than any up-to-date sheet metal shop could, and does, employ.

It is a fact that buses, for instance (not to speak of the various makes of *planes* now under construction for the Navy or Army) all are built by methods not much different than prevailing in the sheet metal shop. Shear-cutting of blanks is done by gauge-set-up governed by a sheet metal pattern; notching-provisioning is done on punch presses on which the gauges have been set by a sheet metal pattern; the braking-forming of parts is being done by gauge-set-up dimensioned by marks incorporated in the pattern. The riveted constructions all have had rivet holes provided in the blanks by layouts of such patterns and, in some cases, by drill jigs made to correspond with the pattern. In spot or other welded constructions the laps and provisions all have been determined by the pattern.

The shearing-cutting operation in the preparation of blanks for processing under the gauge-set-up method has assumed a vastly different aspect from the shearing done by an apprentice in the conventional shop working by the marking method.

In modern sheet metal fabrication, the shearing-cutting and the preparation of blanks for processing has become the MOST important operation because all subsequent operations, the notching and posting of holes or slots and the braking-forming of the parts, all are GAUGED from the edges of the metal; and any variance in the blank will be carried along throughout the number of operations, each showing the variance.

Shear Operator Must Be "Good"

The operator of the shears and the cutters, accordingly, must be a trained man. He not only must know the machine and how to adjust it for work; not only know the standard gauges and their set-up; not only shearing-cutting on parallel lines and the handling of the metal without marring-scratching the surface of it or cut his hands by it. He also must know how to construct auxiliary gauges for himself and shear angles; how to obtain the greatest number of blanks from a certain size sheet; how to set the gauges by either the pattern or by measuring to obtain blanks accurate in size to a few thousandths of an inch and absolutely square; and, among other things, he must know how to operate the machine swiftly, producing the blanks uniformly dimensioned as wanted or specified, in a minimum of time.

When working by a pattern, the operator needs only to lay the metal blank tight against the cutting blade and fasten the gauge tight against its outer edge. Having sheared one or two blanks by the set-up, he posts the pieces and the pattern side-by-side, edgewise, on the level-machined metal of a surface plate, seeing that the upper edges correspond, and if so, he proceeds with shearing the number of the identical blanks by the set-up, inspecting the pieces from time to time and making sure that the gauge did not move in its bearings.

But if the shear-cutting is to be done by blueprint or chart, his work becomes more complicated. First, he must ascertain that his measuring instrument, be it a ruler or a scale, corresponds minutely to the standard scale, for such purposes available in the lay-out room. Next, he must prepare for himself, by measuring, the first blank, in every respect accurate, as per chart or blueprint. Then he may use the blank for setting the gauge as he would the pattern.

From the above it will be seen that the operator working by charts or blueprints, or both, is expected to understand the drawings and the dimensioning as employed in drawings and to do work of transferring dimensions from paper to metal. His knowledge of the measuring instrument and his ability to transcribe dimensions accurately and shear or cut by the lines or marks he makes is one of the qualifications for this work. True, if furnished patterns for shearing-cutting, he is relieved of much of the responsibility. But even so, the operation that results either in good work or in misfits all along in production can not be entrusted to one not sufficiently trained and made dependable by such training and experience, in such work.

In any quantity production in sheet metal, trained and dependable men must be employed for shearing-cutting. In the training of men for sheet metal work the instructor is called upon to produce, among other well informed and capable operators, shearers and cutters qualified as per above requirements. A man trained in shearing-cutting sufficiently well to take up such work in shop or factory and perform it accurately, thereby insuring smooth production in subsequent phases of construction and in the fitting of parts in assembly, even if he should be slow at the start, will be considered a valuable worker wherever employed, much more so than would be a graduate who received instruction in all the various operations but not enough training in any one of them to enable him to step up to the machine or the bench and perform independently and well.

"Specialist" Much in Demand

The instructor must bear in mind that the country is flooded with older and younger men, each claiming to be good at "any work." The employment manager or the foreman seldom waste time with this kind of job applicants, but they will listen eagerly to any man admitting modestly that "he knows nothing outside of shearing-cutting metal to pattern size or specifications." This man will be rushed through the employment procedure and put to work immediately, even if, at the time, there is no vacancy at the shears. He will be put to work, any work, to be available for shearing-cutting in case the present operator becomes sick, or quits, or may be used to advantage in other operations, the lay-out possibly.

But aside from the mere employment question, conditions in shop and factory are such that the foremen despair at the kind of help they must contend with; only a few men really trained and dependable in doing certan work accurately, all by themselves, rapidly enough, and the rest of the employes bearing constant watching, unable to perform a single thing without spoiling it, helpless at the least exacting operation, utterly incompetent in turning out quality work. This situation cannot be ameliorated by increasing the ranks of the incompetents by certifying trainees for employment who have no qualification for at least one, be it yet so limited, sheet metal operation.

Left—Closeup of hangers in place on main roof. Below—Hangers on attached garage. The end tab, which folds over the gutter bead, shows plainly. Main roof cornice board is copper covered.

Copper-Wrapped Gutter Hanger

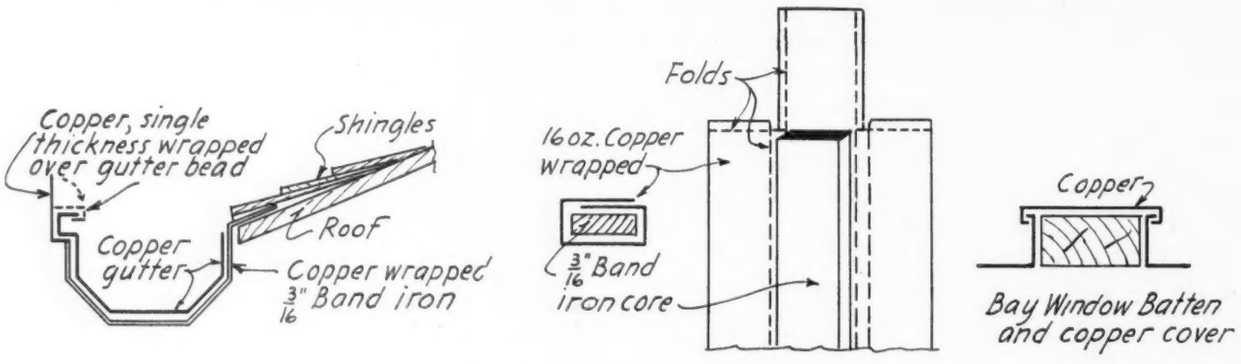
Permits Gutter Movement or Removal

Below—Roofing tile laid over hangers. Gutter can be slipped into hangers after roof is finished.

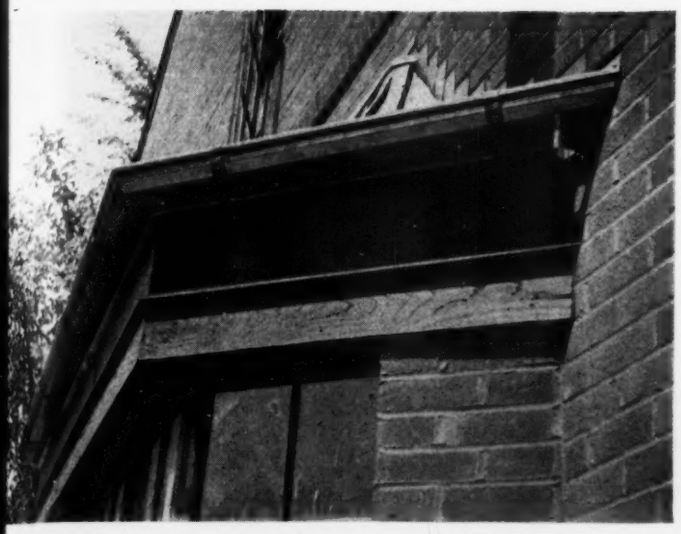
CONTRACTOR Joe Dersher of Toledo, Ohio, on a recently completed residential copper job worked out the interesting gutter hanging idea shown in the photographs and sketch. The idea was to provide the owner with a hung gutter which could readily be taken down for repair, house painting or roof work without disturbing the roof or without taking down the gutter brackets.

The hangers consist of a 3/16-inch band iron core shaped to the gutter contour and wrapped in a 16-ounce copper wrapper as shown. The copper was left longer than the core and this tab end

Below—Details of iron core with copper wrapper and method of holding gutter. At right end, batten construction on window bay.



GUTTER APPLICATION USING COPPER WRAPPED BAND IRON HANGER



Left—The gutter on the window bay is held in place similarly to main roof gutter. Below—The bay window roof is batten construction (see sketch) with a combination ridge and flashing.

Below—Snow guard brackets are riveted to an iron plate which has turned down edges and is wrapped in lead for permanent protection. Text explains construction.

was turned over the gutter head as shown in the sketch. The tab wrap serves to hold the gutter in position and permits longitudinal movement in the gutter.

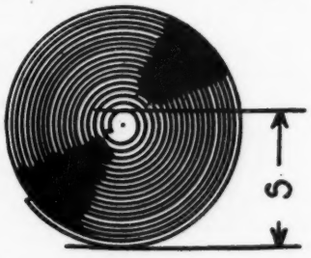
As the sketch shows, the wrapped bracket is inserted under the roofing and need not be disturbed during any gutter work. It is expected that the wrapper will give the bracket as long a life as the roof.

One of the photographs shows a snow guard plate in position. This plate was also specially devised by Mr. Dersher and consists of a 16-gauge plate with all four edges turned down to form a plate as thick as adjoining shingles. The top surface and all four flanges are covered with a four-pound lead sheet. The guard bracket of brass was riveted to the 16-gauge plate with brass rivets through the lead sheet.

The pictures also show a small copper hood over a bay window. This was constructed with wood battens as shown in a sketch, using a copper counter flashing to waterproof the connection between roof and gutter. This gutter is also hung in place with wrapped brackets.

How To Measure Strip in Rolls

SHEET metal plants using material that comes in rolls often have to solve the question, "How much material remains in that roll?" Or, "Does the original roll contain full length?"



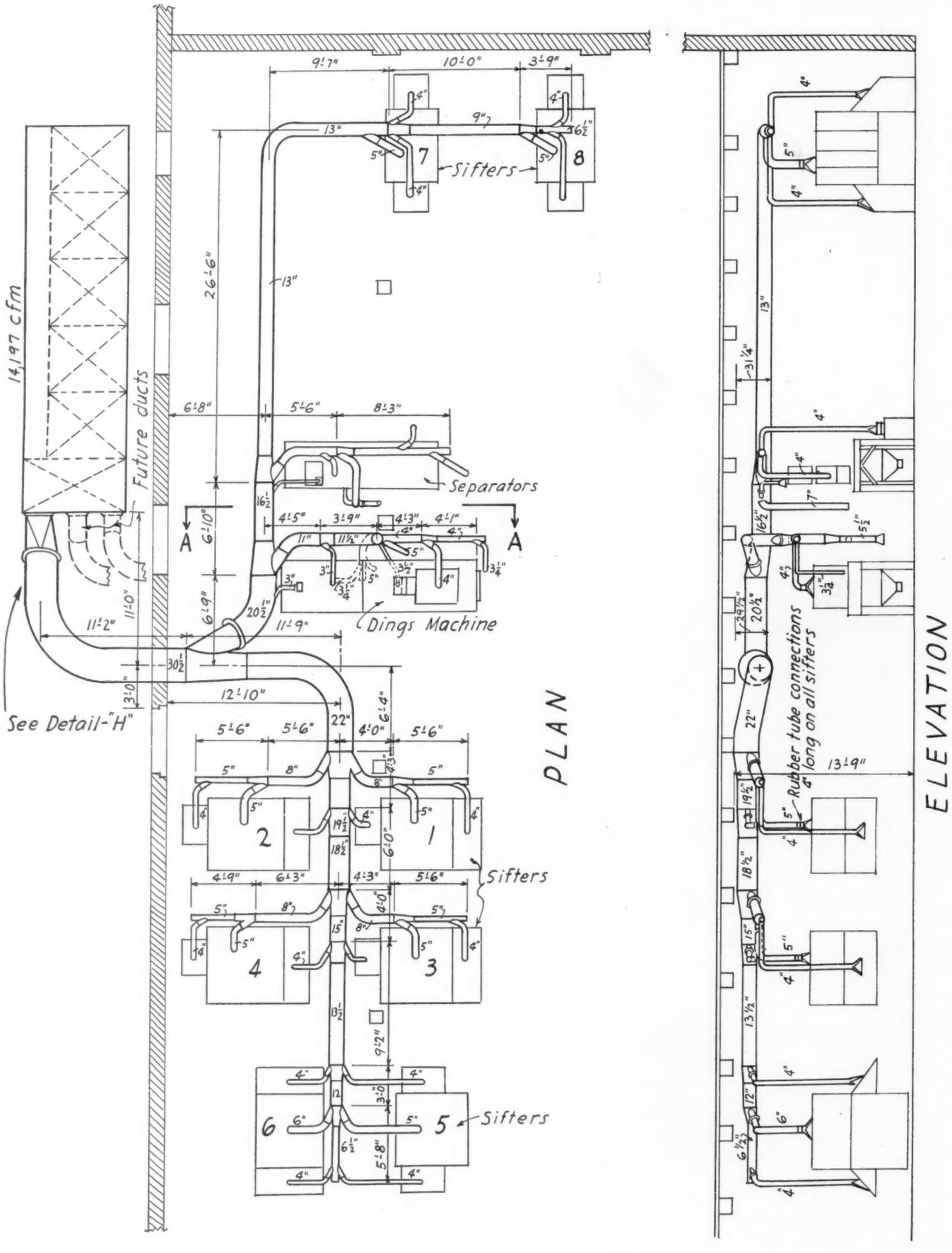
There are numerous formulas for computing lengths in rolls, but most of them are more or less complicated. We are told to find the outside diameter, the inside diameter, then subtract, multiply, and do various other things, and finally we get the answer.

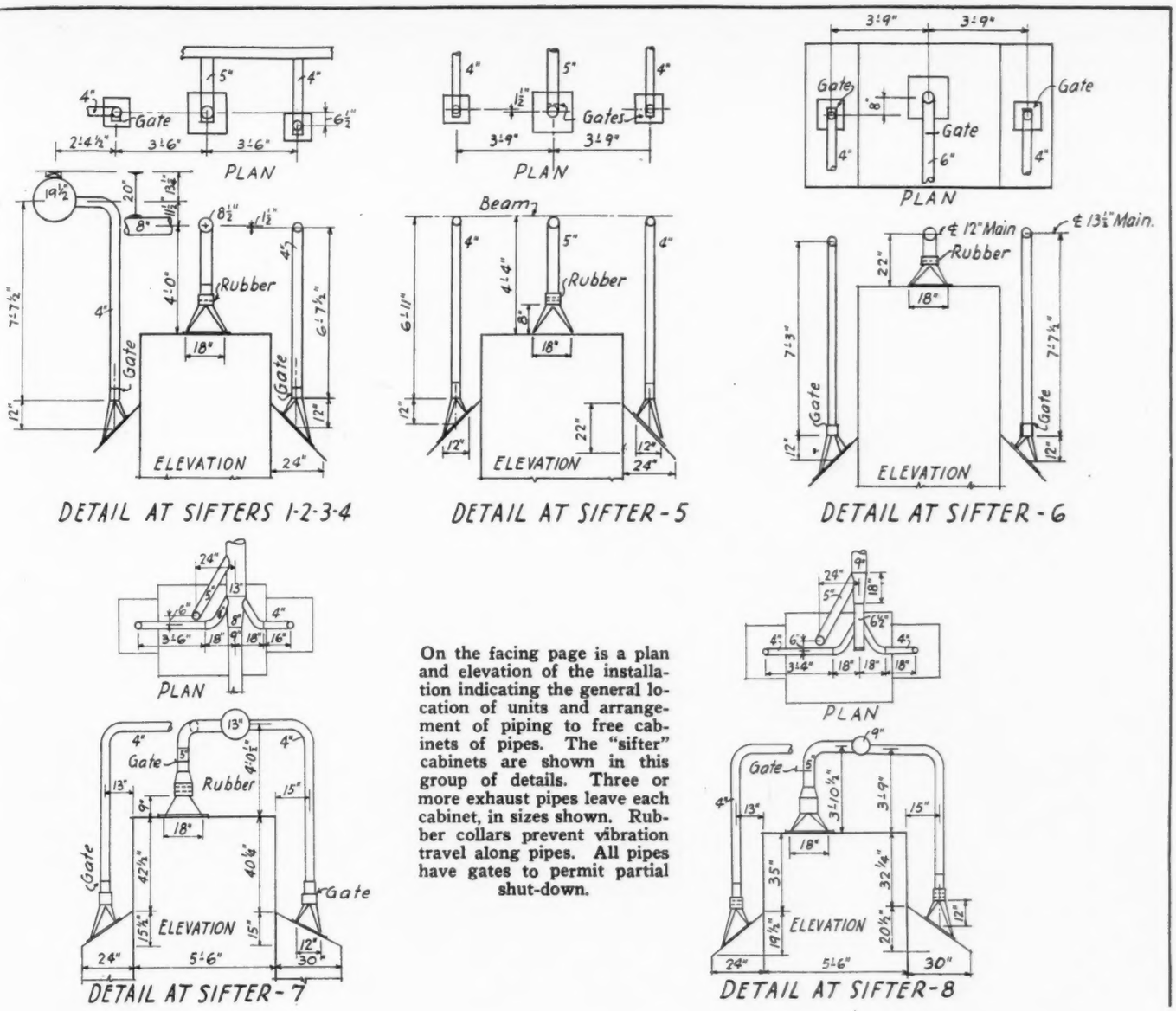
Here is a simple rule which gives an accurate answer: Make the one measurement "S," as shown in the sketch herewith, in inches. Then count the number of turns. Multiply the two together and then multiply that by 0.2618. The result is the length of the roll in feet.

For example, if the distance "S" is 10 inches, and the number of turns is 10, the roll contains 26.18 feet.

This holds true regardless of the kind of material

(*Continued on page* 84)


14,197 cfm
Future ducts
See Detail-"H"
Separators
Dings Machine
Sifters
Sifters
Sifters
Rubber tube connections long on all sifters
PLAN
ELEVATION



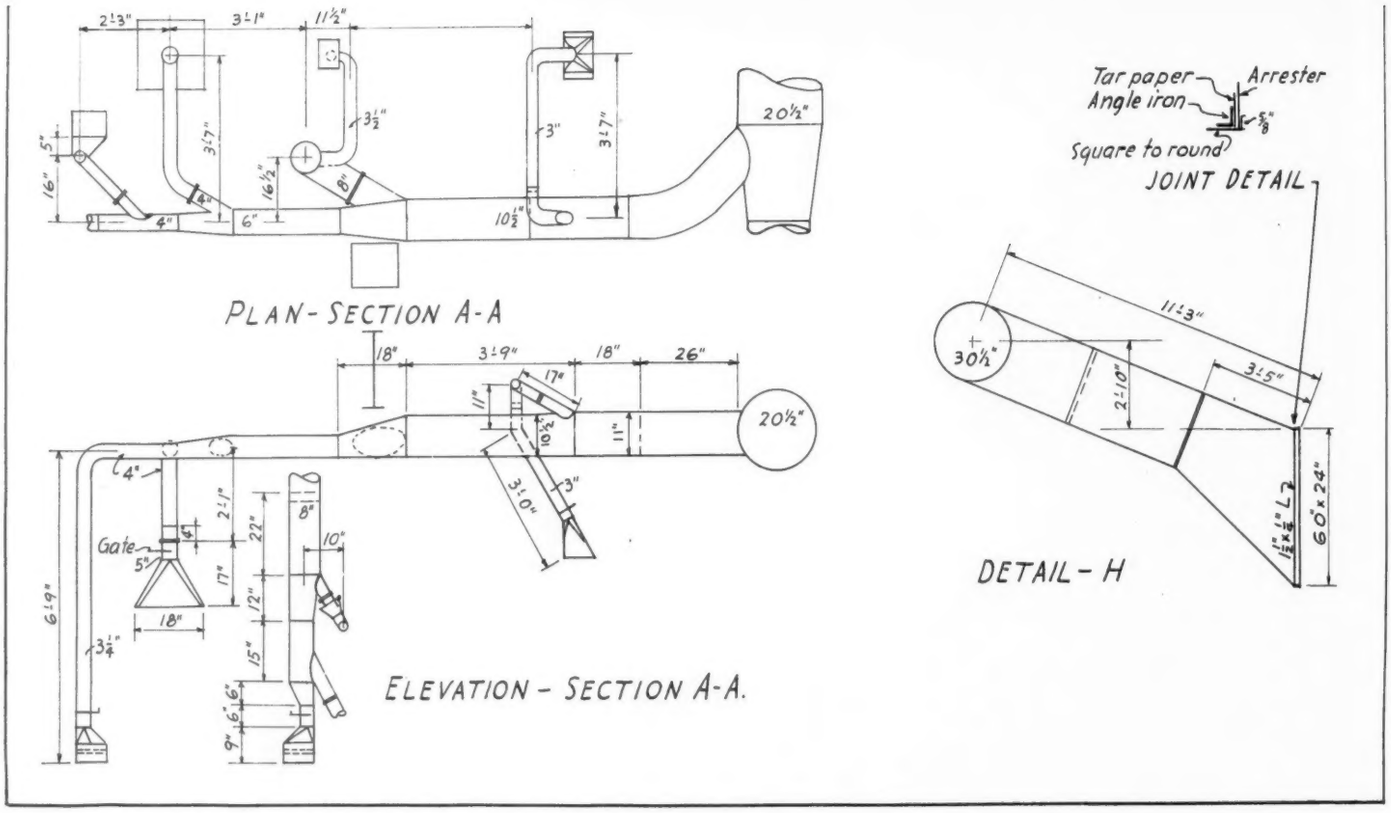
On the facing page is a plan and elevation of the installation indicating the general location of units and arrangement of piping to free cabinets of pipes. The "sifter" cabinets are shown in this group of details. Three or more exhaust pipes leave each cabinet, in sizes shown. Rubber collars prevent vibration travel along pipes. All pipes have gates to permit partial shut-down.

Dust Collecting System For Abrasives

THE dust collecting system shown in the plan, elevation and details accompanying was fabricated and installed recently by the H. J. Otten Sheet Metal Works, Buffalo, N. Y., in the plant of an abrasives manufacturer.

The installation is designed to handle dust from one particular step in the manufacturing process in such a way that the dust is removed from the source of production and collected in a remote separator outside the room of origin. In this process the abrasive materials are passed through "sifters" (see plan) which are mechanical shakers in which the abrasive particles are segregated to size by passing through vibrating screens. In this shaking process dust is given off. This dust is not wanted in the sized particles, so the dust is removed by the system described.

The sifters and complementary machines are arranged as shown in the plan. The general shape of the sifters is shown in the details. To each sifter cabinet three or more exhaust branches were connected as shown in the plan, the elevation and the details. These branches rise to the ceiling and connect horizontally to the graduated main as shown. Since considerable volumes of air are handled all through the system and since the dust and entrained particles are particularly abrasive, every effort was made to obtain long radius turns, elbows and connections. The dimensions show that at least 1½ pipe diameters and



Details of piping at Dings machine (see plan) and method of joining piping main to dust collector.

frequently even easier sweeps were obtained.

The details show that all branches from sifters are broken by rubber sleeves just above the cabinet. These rubber sleeves permit the cabinet to vibrate without transmitting the vibration to the pipe work.

The plan and details also show that connecting rings were used generously throughout the piping. These rings are placed in the first section of each branch and at both ends of all main line elbows, transitions, etc. These rings, being readily demountable, permit removal of fairly short sections of pipe for cleaning, replacement or alteration.

There is also a gate in each branch, close to the rubber sleeve and cabinet to permit shutting off any sifter or any part of a single sifter should this be necessary.

General duct measurements were obtained from customer's blue prints, later checked on the job after the machines were in place. All straight pipe and all fittings were made up in the Otten shop and delivered at the job ready for erection. The job required some 4,000 pounds of sheets.

Since this installation is in New York State, the New York State Department of Labor regulations applied. Necessary velocities and permissible dust concentrations had to be met and pipe work installed according to regulations. For systems handling abrasive materials, ducts are constructed of 18-gauge for sizes 5 to 18 inches; 16 gauge for sizes 18 to 30 inches; 14 gauge for pipes above 30 inches in diameter.

The plans indicate that this system is located within a building. The total exhaust is approximately 15,000 cfm, which volume is replaced by open doors and windows in the room. The exhaust is carried to the floor above and into a separator where air is vented and abrasive particles reclaimed. Dust is wasted from the collector.

How to Measure Strip in Rolls

(*Continued from page* 81)

and the thickness of the material does not make any difference.

To check the rule, take an instance where we have only one single turn of belting, the distance "S" being 10 inches. The roll, then, is a true circle, and the distance "S" is the diameter of that circle. The length of the belt, of course is equal to the diameter times 3.1416 or, 31.416 inches. Now divide that by 12 and you will get 2.618 feet, as per the above rule.

Even if the roll is so tightly wound that there is no visible hole through it, the rule still holds true. And, ditto, if the roll is loosely wound.

30 Common Finish Complaints—Their Causes and Corrections [Part 1]

The Sherwin-Williams Co., Cleveland, published a booklet, "Complaints—Causes, Corrections in Products Finishes" which is considered, in the finishing field, as interesting and useful. By permission of Sherwin-Williams, we reprint the booklet in two parts.

BREAKING OF LIQUID

NOTE: If the break is too pronounced, it may not be possible to put the material back into condition satisfactory for use.

Cause

A. Wrong solvent used.

B. Subjected to unusual conditions of heat or cold.

C. Over-reduction.

D. Reducer added too fast without sufficient stirring.

E. Natural oxidation of the material if allowed to remain open to the air over a period of time.

Remedy

A. If the break is slight, the slow addition of the proper solvent, along with constant agitation, may effect a good result.

B. Keep material at a temperature from 70°F. to 75°F. If break occurs because of extreme of either heat or cold, the treatment is similar to correction E.

C. Follow directions for proper reduction. If material already overreduced, addition of fresh material will often bring entire batch back to proper state.

D. Add reducer slowly, stirring constantly.

E. Addition of proper amounts of solvent plus infusion of fresh material will put batch into condition if oxidation has not proceeded too far.

It is usually well to choose a reducer of greater solvent strength than originally recommended.

SKINNING OF LIQUID

Cause

A. While it has been possible to a large extent to minimize skinning, it is something which will occur to a varied degree whenever any air drying enamel is exposed to the air. Skinning can be almost entirely eliminated in baking enamels where tank conditions are reasonably good.

Remedy

A. Make sure that containers in which the material is stored are air tight. Dipping tanks should preferably have an oil or water sealed cover and cover should be in place whenever tank is not in use. Whenever conditions are such that skinning cannot be overcome by a normal means, advise the technical department of your paint manufacturer, giving complete particulars.

Note: To avoid skinning during storage of open containers, or during long disuse of dip tank—

a. Oil-type materials—cover remaining contents of partially filled container with small amount of turpentine before sealing.

b. Synthetic type—cover remaining contents of partially filled container with small amount of synthetic reducer before sealing.

SAGGING OF FILM (CURTAINING)

Cause

A. Sagging is caused either by over-reduction or by use of too slow a solvent.

B. Application of too heavy a coat.

C. Draft condition.

D. Strong sunlight causing top drying and consequent later slippage of film on vertical surfaces.

E. Uneven distribution of spray coating.

F. Jerky operation of mechanical equipment for withdrawal from dip tank.

Remedy

A. Use the proper solvent consistent with the general nature and temperature of the surface to be coated.

B. Apply thinner film.

C. Eliminate draft.

D. Avoid application in strong sun light.

E. More careful application.

F. Repair or redesign equipment.

LACK OF FLOW

Cause

A. Insufficient reduction.

B. Use of solvent with too fast an evaporation rate.

C. Improper atomization of spray gun.

D. Application of too thin a film.

Remedy

A. Reduce according to instructions.

B. If fast evaporation is due to local weather conditions, choose a slower evaporating solvent than originally recommended.

C. Adjust spray equipment.

D. Apply more material to surface.

WASHING OF FILM

Cause	Remedy
A. In some dip operations, faulty ventilation in the hood above the dip tank allows a concentrated collection of solvent vapors which reduces the film on the object which has just been withdrawn from the dip tank, thereby causing the film to wash or flow off the finishing surface.	A. Provide proper ventilation over dip tank.
B. Faulty ventilation in oven causes concentration of vapor.	B. Provide proper ventilation.
C. Wash caused by cleaning solvents remaining in crevices.	C. Be sure surface is clean, as well as all crevices.

NON-DRYING OR POOR DRYING

Cause	Remedy
A. Humid weather.	A. If possible, place in heated drying room.
B. Cold weather.	B. Maintain a temperature of at least 65°. 75° is desirable for normal drying.
C. Adsorption of drier by paint material.	C. While it is a problem of formulation to avoid possibility of drier adsorption, there are occasions when the best formulated products are apt to face that difficulty. Remedy is to add up to 3% of the proper drier.
D. Greasy, waxy, or otherwise, unclean paint surface.	D. Clean surface carefully with volatile solvents. If metal, use special metal treatment, such as Metalprep, Galvaprep, Lithoform, etc.
E. Failure to stir all pigment of pigmented finishes into proper suspension before application. Failure to stir properly unbalances formula of applied material and often will cause poor drying.	E. Stir it.
F. If application is over a stained surface, there may be some dye in the stain used which tends to prohibit drying.	F. Use the proper stain.
G. Improper ventilation.	G. Provide ventilation.
H. An attempt to fill rough wood or metal by applying a heavy coat retards through drying.	H. Do not attempt to use finish coat as a surfacer. Apply only a full covering coat.

SPOTTY DRYING

Cause	Remedy
A. Unclean surface.	A. Clean carefully with volatile solvent or if metal, with a commercial metal cleaner, such as Metalprep, Galva-Prep, Lithoform, etc.

LACK OF HIDING

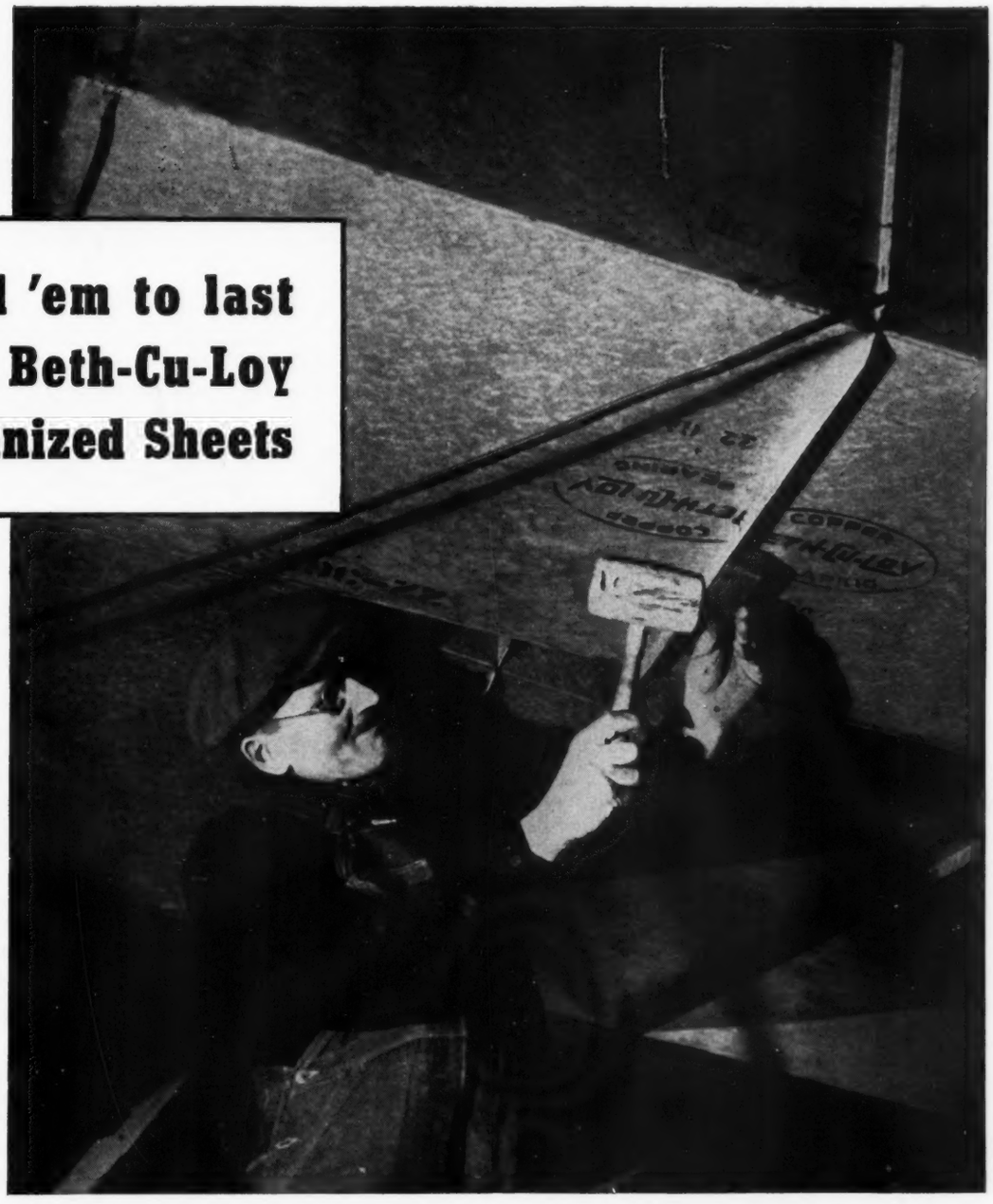
Cause	Remedy
A. Over-reduction.	A. Add fresh, unreduced material to that which has been reduced.
B. Application on very cold, smooth surface which tends to cause film to flow off.	B. Use a faster evaporating solvent.
C. Pigment not properly stirred into suspension.	C. Stir it.
D. Too slow evaporating solvent causing too much flow.	D. Use faster solvent.
E. Improper atomization.	E. Adjust spray equipment.

LACK OF ADHESION

Cause	Remedy
A. Certain types of metal such as galvanized iron, cadmium, zinc are difficult surfaces.	A. If normal methods of metal preparation do not overcome adhesion difficulties, then send full particulars, along with samples of metal, to your paint manufacturer.
B. Unclean surface.	B. Clean carefully with volatile solvent, or if metal, with a commercial metal cleaner, such as Metalprep, Galva-Prep, Lithoform, etc.
C. Lack of film toughness, produced by over-addition of drier.	C. Check results against fresh material to which no drier has been added.
D. Mar-proofer in previous finish or in first coat.	D. If refinishing over mar-proofed old finish, clean carefully with strong volatile solvent. If mar-proofer is in the first coat just applied, it will be necessary to choose another type of undercoater or else a mar-proof finish which will allow application of another coat over it without loss of adhesion.
E. Sometimes the finish coat and the primer used are not meant to be used together, and the solvent in the finish coat practically lifts the primer from the surface. Even though film will dry and have good appearance, primary adhesion has been ruined.	E. Make sure that the proper recommended primer and finish coat are used together.
F. Overbaking, which accelerates loss of flexibility in the film.	F. Check oven and bake according to instructions.

(To be continued)

Build 'em to last with Beth-Cu-Loy Galvanized Sheets



Customer satisfaction is a mighty big item in any business. Yet it's one principal factor for success that's not hard to get and keep. For instance, take the use of Beth-Cu-Loy galvanized steel sheets when you build duct work for a residence or a larger contract.

These quality sheets are made to last. They are doubly protected against corrosion: outside by the tight, heavy coating of prime Western spelter; inside by the addition of 0.20 to 0.30 per cent copper to the steel itself. In tests by an impartial fact-finding body, sheets of similar analysis outlasted ordinary steel sheets by more than two to one.

That's an increase in service life worth thinking about—and you can give your customers this added value at a cost of only a few cents more per sheet—a few dollars more on an entire installation. On your next job, use Beth-Cu-Loy Sheets. Let your customers know about this extra service. Write to Bethlehem Steel Company, Bethlehem, Pa., for your free copy of Booklet 113, containing full Beth-Cu-Loy information.

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IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING

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The Third Edition
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Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

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CONTENTS

CHAP. 1—Terms Used in Air Conditioning
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CHAP. 3—Air Conditioning Standards
CHAP. 4—Air Conditioning and the Human Body
CHAP. 5—The Psychrometric Table and Chart
CHAP. 6—Humidity Controllers and Control
CHAP. 7—Heat Transmission Through Barriers
CHAP. 8—Ventilation, Solar and Appliance Heat
CHAP. 9—Heating Systems
CHAP. 10—Air Conditioning Systems
CHAP. 11—Air Conditioning Apparatus
CHAP. 12—Refrigeration and Refrigerants
CHAP. 13—Refrigeration Compressors and Condensers
CHAP. 14—Refrigeration Evaporators and Auxiliaries
CHAP. 15—Record Forms for Heating and Cooling
CHAP. 16—Air Distribution
CHAP. 17—Water in Air Conditioning
CHAP. 18—Noise and Its Control
CHAP. 19—Air Conditioning Instruments and Measurements
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NAME .....

STREET .....

CITY & STATE.....

Three Cardinal "Musts" for

Successful Furnace Sales

By G. F. Goodall
Williamson Heater Co., Chicago

SELLING is a vital problem in any business for, if you don't sell, there is no further operation.

It makes little difference what the product is; or whether the business is large or small; or to whom you seek to sell.

Because selling is so essential to our methods of doing business, a tremendous amount of hooey and bunkum have been perpetrated upon the business man and his selling force. Whole businesses have sprung up whose sole purpose is to cloak selling in a mystifying maze of "do's" and "dont's" and to make the business man feel that tricky sales training or an expensive sales management is necessary for successful distribution of his products.

The truth of the matter is that selling is not mysterious and need not be expensive and can still be based upon a few very old principles.

I can illustrate this point by relating a recent experience. Not long ago I got into a sales meeting by mistake and, once in, couldn't gracefully get out so decided to stay and hear how to sell. The "fountain head" started off by telling us that a good salesman must have a super-abundance of vim, vigor, and vitality. His whole talk hinged on the old high pressure stuff which believes—"Knock 'em dead and get the order before they regain consciousness" which I thought had gone with the wind of the depression.

The fountain head forgot to mention that some intelligence and a willingness to put that intelligence to work is worth more than all the "do's" and "dont's" in the book.

So far as selling furnaces to home owners goes there are still only three necessary principles:

1. Have a good product
2. Know that product from A to Z
3. Make friends with your prospect and obtain his esteem

As to number 1, the furnace industry abounds with many first class lines and the only problem is for the dealer to select the source of supply which offers him the best service for his requirements.

As to number 2, it seems plain common sense that a man ought to know as much as possible about his product (particularly that product's good points) and he should make these good points appealing to the prospect just as these good points appealed to the salesman when he selected the product.

As to number 3, I think it was Elbert Hubbard who said: "The way to make friends is to be one" and you can't establish a friendship by being dishonest, personally objectionable, perpetually pessimistic, loudly opinionated.

Good selling must be based upon honest dealings, for one small lie found out can do more harm and queer more sales than almost any other mistake the salesman can make.

Dirty overalls and muddy shoes are objectionable to many persons, especially the woman of the house, so why stomp into her house dirty and ragged and looking like a tramp.

"The man with a smile is the man worth while," is an old truism—and it doesn't mean a perpetual smirk which most people spot immediately. But it does mean an honest smile and a friendly word and a cheery personality. Having these, you make the prospect like you and want to buy from you, other things being equal.

These are not hard-to-follow recommendations. They should be easy medicine to take when we remember that the hardest task of all is to find that prospect. Having found the prospect we should prize our find and desire to make the prospect our customer. Why kill the possibility just because you are too lazy or careless to adopt a few simple suggestions?

And lastly—it is not often necessary to give your services away to make a sale. Most people expect to pay a profit on the things they buy. Of course, they want the best "buy" they can get, but don't forget that the "best buy" is not made up of price alone but is the price of the article which offers the most things the buyer thinks he wants. You make your price the best buy when you convince the prospect your proposal contains the most features he wants and needs.

The telephone can hardly close a sale, but as a time and labor saver in prospecting it is 1940's most reliable canvasser. This article tells how to make your telephone a sales assistant.

Working "the Wires" to Home Owners

By George Strader

IT is one of the strangely contradictory angles of the heating and air conditioning industry that this most personal of household services has made so little use of one of the most personal and effective of all sales media—the telephone.

You will scrap many a notion about the value of personal door-to-door canvassing and distribution of sales promotion literature if you will conscientiously test the following plan for locating qualified prospects without leaving your office. The plan is the distillation of this writer's twenty years in telephone selling and is completely set in principle; the formula has been tested in New York, but may require very minor modification to meet individual requirements.

The Market

The ultimate market includes every telephone listing to which the dealer might expect to sell. Finding new customers in the directory is then a matter of skipping undesirable names and neighborhoods and using all the rest. Let us now confine the test market to any one hundred families living in desirable sections. Select your names from the middle of the book for this test; you will thus avoid overlapping with other users of the wires, most of whom start at either the front or back of the directory. Later, as you become practiced, you will not have to care.

The Proposition

That old Weber and Fields gag, "He talks, but says nothing," really underlies the situation in practically every case where businessmen have given up telephone selling as ineffective. The very basis of this plan is to secure from the *housewife* definite information that will lead to a sale. You must have *something to say* to get this information.

The housewife solicited by telephone is solicited under the most favorable of all possible circumstances. She has no fear of a stranger at her door, and she answers freely. If in negligee, she nevertheless talks at ease without requiring the caller to shout his message up to a second-floor window. Frequently she speaks at great length; because she knows she can stop at will. She "opens up" to a degree unknown to door-to-door canvassers.

But she does expect, and rightly so, that the man on the wire will express something more than an ardent wish to collar her cash. This feeling of hers is not confined to telephone callers; it also has something to do with the many eggs laid by door-to-door canvassers. But it is really homicidal when aimed at a man who cannot *force* her to listen; to hold her on the wire he *must* have something to say. This writer has seen some mighty bad salesmen make a lot of money with good planning; and many a star take a licking without it.

The Approach

Of Kipling's six honest serving men—"Their names are What and Why and When and How and Where and Who"—there are only two that need immediately concern the dealer. *Who* is considering new equipment or service? *When* will he be ready to talk business. These two ends can be arrived at quite accurately on each telephone call.

Let us call "Mr. Preston's" home, during the day, when he might be expected to be out at his business. A woman's voice answers the telephone.

Dealer: "I'd like to speak to Mr. Preston, please."

Mrs. Preston: "Why, Mr. Preston is at his office. Who is this?"

Dealer: "Who is this—Mrs. Preston?"

Mrs. Preston: "Yes, this is Mrs. Preston. Who is this?"

Dealer: "Mrs. Preston, is Mr. Preston going to buy a new oil burner this Spring?"

Mrs. Preston: "Why, he was talking—who *is* this?"

Let us stop here and take stock; on long, sound experience.

The dealer asked for *Mr. Preston,* but he certainly hoped that Preston would be out; no man will ever spill as many beans to a salesman as his wife will. But, in asking for him, he created the impression that Preston was in on this and he put her off her guard He also avoided possible complication with Preston himself. Mind, also, that the dealer did not tell her who he was; if he had done so, he would have killed, absolutely, the value of the pay-off question that was to follow. Call this "psychology" if you will—this writer hates the word—but we will have to make the best of it.

Get your teeth into the meat of that question—"Mrs. Preston, is Mr. Preston going to buy a new oil burner this Spring?" And sink them doubly deep into that word *buy.* The dealer did not say "consider" or "install" or any of their numerous synonyms; he said *buy.* This vital question is designed to comb out deadwood, as much as to locate real prospects; your real prospect has no objections to the ruder word.

The woman in this case immediately qualified herself; she didn't say yes and she didn't say no, but she did say enough to warrant the immediate and continued attentions of a good closing salesman. They won't all answer as she did; a good 95% will make it a definite no—but there will be many a good service lead among them; a trifling percentage will frankly say yes—but they will not necessarily be the best leads you get; the 4% or 5% of real leads will generally *reveal* their qualification, rather than state it outright.

Listen for chance remarks, to most accurately determine the true status of each case; they are far more important than definite yeas and nays.

Now let us go on.

Dealer: "Mrs. Preston, this is Mr. Clarkson—of the Clarkson Heating Service Company. We know that Mr. Preston has been talking about a new oil heater (that's no lie, at this point) and we are wondering if he has definitely made up his mind to buy this Spring or to wait for the late Summer. Will *you* tell me, please?"

Mrs. Preston: "Oh heavens, not this Spring any more; not until much later in the year."

Well, there you have the 100% American who hugs his check book—until the right salesman goes to work on him. That aspect of the sales problem is not contemplated by this plan; this plan is concerned only with the finding of good leads for right salesmen to go to work on. "Mrs. Preston" was such a lead; and she is typical of what you can get by telephone canvassing.

Let door-to-door canvassers use this method, however, and you will take a gorgeous nose dive. It works only over the telephone, coming like a bolt from the blue. The speaker's voice helps immeasurably; with a cheerfully and mysteriously expectant pitch, and enunciation that is fairly rapid and very clear. Solemn, mealy-mouthed talkers do not belong on the telephone—or at the doorbell, for that matter. But mind you, above all things, it is the angle of mystery and surprise that gets under their skins; that really makes them talk in terms of usable sales information.

What Is in It for the Dealer

The percentage of returns that the dealer gets depends largely on personal and competitive factors and is not accurately predictable. If figures will guide, this writer this year made a March test of one hundred calls in the hotly competitive New York suburban area. Six leads came out of it and these were turned over to a chap who is a corking good serviceman but who, unfortunately, is handicapped by a pronounced foreign accent.

Two of the six leads petered out; two resulted in monthly service business; one, for an installation, is up against stiff competition and stands only a 50/50 chance in this salesman's hands; the other, for an installation, is practically in the bag as this is written.

The telephone calls were made in one day; the cost could have been held to five dollars if the work had been made a spare-time task. In spite of the negative closing complications, the profits seem good in relation to cost.

But this writer's proficiency is not attainable in one hundred calls; it has twenty years of experience in back of it. The average dealer must make two hundred or so really to tune up; but one hundred will demonstrate the rare possibili-

(*Continued on page* 113)

Association Activities

New York State

The New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., is publishing in mimeograph form, 8½x14 in. sheet, with up to the minute news for progressive roofing and sheet metal contractors.

The July 5 issue announces the auxiliary outing and urges members to attend.

Attention is called to the extension of FHA by Congress until 1944 and members are reminded that by their helping hand in membership ($5.00 per year) the association is able to foster and promote "good things" for the benefit of the industry.

The 95,000 homes for defense workers called for in the Federal Defense Housing Plan is mentioned, and dealers are asked if they are getting their share of the heating, roofing and metal work. "The Lanham Act provides that wages shall not be less than prevailing rates."

Forty-seven firms are now members of the State Group Compensation Fund known as Group 194. The Group has been approved by the State of New York, and is now in complete operation. Group Compensation Managers, Laverack & Haines, Inc., are gradually building up the group in membership. Members are reminded that they can still join at the expiration of their present policy and enjoy the benefits of membership in the group during the first year. After the first dividends have been declared, it will cost extra to join. Thirty days notice of intention to join is invited.

Clarence J. Meyer, State Secretary.

◆

Indiana

The next district meeting of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc., will be held in Fort Wayne on August 22 instead of August 29, as announced previously.

The meeting will be held August 22 at the Wayne Hotel, Fort Wayne, at 7 p. m. central daylight savings time.

Homer Selch, Secretary.

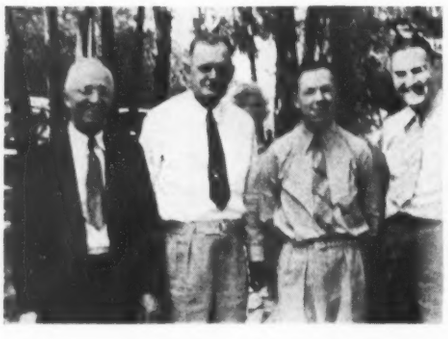
◆

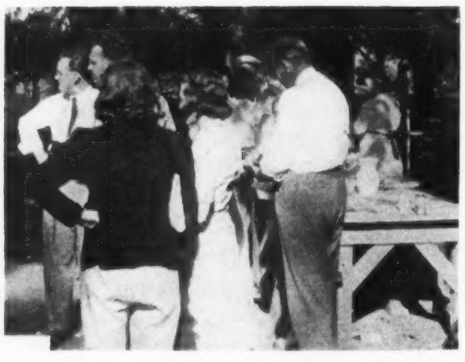
A Chicago Picnic

ON July 13, the Chicago Furnace - Air Conditioning - Sheet Metal Institute members and guests enjoyed a day in the country at the organization's annual picnic. Perfect weather once again favored a large gathering. Picnic committee members planned a full day of sports and games, with refreshments and facilities for boating and swimming.

As customary, members and supply house representatives staged a soft ball game won by the dealers. The youngsters were not forgotten —numerous contests with prizes keeping them happy.

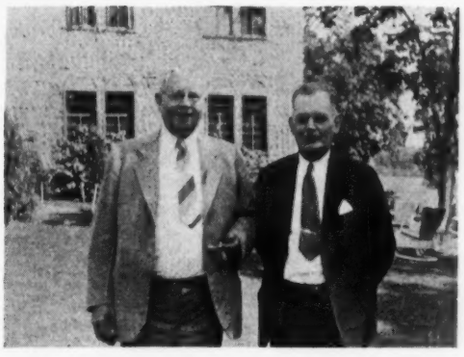
The refreshment stands presided over by member bar tenders and ladies of the auxiliary did a rushing business all day — pop, candy, sandwiches, ice cream and of course beer—disappearing like magic. Many families and groups brought picnic lunches, stoves, radios, record players to provide against the full day.





◆

Upper left—Girls' rope jumping contest. Upper right—Someone made a poor decision. Center left—Salesmen Gierman, Mackin, Reining, Schwoerer. Center right—The Joy boys (Republic Metals) brought wives, children and cameras. Lower left—The salesmen knock one into the bleachers. Lower right—Boys' potato race grubbed up considerable turf.



Upper left—Treasurer George Bushman collects fees from John Novak, Chicago, and Clayton Evellen, Elgin. Upper, right—Horse shoe audience "takes it easy" while players toil. Lower, left—Wise, Nemec, Ziebold, Leonardt fail to "get hot." Lower, right—John Sheets (Messenger and Parks) and Reid Mackin (International Heater) pause on the way to refreshments.

Fox Valley Picnic

Fox River Valley Assn. (Illinois) dealers, salesmen, guests "played" July 17 at St. Andrews golf club. Some two-somes and four-somes tried course 2; others not quite so ambitious (it was pretty hot) pitched horse shoes or just sat in the shade and chinned. Dinner in the evening closed the day.

Golf winners were:

Low Gross—Melvin Jackson

1st Blind Bogey—Larry Walquist

2nd Blind Bogey—Ed Staler

3rd Blind Bogey—Fred Nolting

4th Blind Bogey—Ray Lorenze.

High Gross—F. Snider.

Horse shoe champions for the day were S. Delardo and John Krehbiel.

Association President Jack Stowell presided at the dinner, introduced some of the guests and awarded prizes.

—Fred R. Lamp, Secretary.

Milwaukee

The Milwaukee Sheet Metal Contractors Association's first annual picnic was held at Mequon Park at Mequon, Wisconsin, on July 23, with an attendance of approximately 150.

With perfect weather conditions, the program included:

9-11:00 A. M. Get together and Gemuethlichkeit with superb lunch and refreshments.

1:00 P. M. Dinner as selected—Sauerbraten with Bayerishe Knoetel or Chicken followed by music and song.

2:30 P. M. Baseball (annual) — Salesmen vs. Sheet Metal Contractors, umpired by professional umpire Lefty H. C. Hafer of Chicago.

3:30 P. M. Shoe Kicking Contest.
Egg Throwing Contest.
Turtle Races, placing bets on turtles named and marked Hielscher, Biersach, Angelo Hoffmann, Brenner, Gehrke. Turtles placed in the center of a large ring, permitted to run as fast as they can toward and over the large outer circle, first one performing this wins.
Horseshoe Twirling.
Target and Arrow Shooting.
Card games of every description.
Prize drawing—about twenty prizes, donated by members and jobbers and manufacturers.

5:00 P. M. Delicious ham lunch with refreshments.

6:00 P. M. Gumeuthlichkeit—card playing, Kletschfests.

Those who contributed and donated towards the success of this picnic were: E. A. Scott Publishing Co. of New York, Bert Bagley, Sheet Metal Supply, Federal Products, Milwaukee Stove, Milcor Steel, Auer Steel & Furnace, L. J. Muellar Furnace Co., Howard Brass & Copper Co., Gus Steinberg, Gibbs Steel Co., Shadbolt & Boyd Co., Minneapolis Honeywell, Barber-Coleman Co., all of Milwaukee—Rutland Furnace Company of Chicago and others. The committee feels gratified and appreciative for the gallant support given by these firms **unsolicited,** which speaks for the friendly and cooperative spirit existing between the jobbers-manufacturers and the sheet metal contractors of our industry.

The August 4 meeting was called to order by President Angelo Hoffmann.

Chairman A. Walters reported on the Mequon Park picnic with receipts of $296.25 and disbursements of $304.73—deficit $8.48.

At the meeting of the Board of Directors, the following plan for fall meetings was adopted:

Setember 8—L. J. Mueller Furnace Company will entertain with a sound film.

October 6—Max Walten, representing Copper and Brass Research Association, will address and lead the discussion on installation of sheet copper. This will be an open meeting to which members of the Wisconsin state association are invited.

November 3—Johns-Manville will present the movie on house insulation.

Paul L. Biersach, Secretary.

◆

New York Merchandisers

The Merchandisers Association, auxiliary to the New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., held their second annual mid-summer meeting and outing at Drumlins Golf and Country Club, Syracuse, N. Y., on July 24 with a good attendance of both merchandisers and contractors. Everybody seemed to thoroughly enjoy themselves and this event now looks as though it will become a permanent feature.

Following are the prize winners of the various events:

GOLF FOR CONTRACTORS

Patrick Varden, Albany, N. Y.....1st Prize
Art Heaphy, Syracuse, N. Y.....2nd Prize

GOLF FOR MERCHANDISERS

Don Gay, Syracuse, N. Y.....1st Prize
Ben Huntington, Rome, N. Y.....2nd Prize

PUTTING CONTEST, OPEN EVENT

George Ballard, Rochester, N. Y., Contractor
J. Thompson, Buffalo, N. Y., Merchandiser

DOOR PRIZE

Howard Riddle, Rochester, N. Y. (M).....1st Prize
Bill Schmidt, Rochester, N. Y. (C).....2nd Prize

C. H. Lighthart, Secretary.

New Products

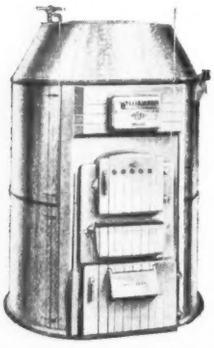
For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 103 and mail to us.

● Indicates product not listed in 1941 Directory.

△ Indicates manufacturer not listed in 1941 Directory.

133—Tripl-ife Furnace

The Williamson Heater Company, 337 West Fifth St., Cincinnati, Ohio, announces the new Tripl-ife furnace. In addition to the new front, the grate



shaker mechanism, and the radiator cleanout equipment are new, and the entire line has been provided with a larger fire pot and a larger grate.

There is also a square cased model with rounded corners, finished in a metallic brown baked enamel.

◆

134—Heating Plant Analyzer

Weaver Manufacturing Company, Heating Plant Division, Springfield, Illinois, offers a new heating plant analyzer designed to aid in servicing and merchandising oil burner in-

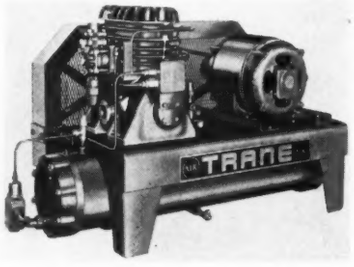
stallations. The new instrument employs the Wheatstone Bridge principle to show stack temperature, draft, and CO_2 content.

The instrument is enclosed in a light weight, compact leatherette case which opens to reveal the three dials.

135—Reciprocating Compressors

The Trane Company, LaCrosse, Wisconsin, offers the Trane reciprocating compressor in ten sizes—3 to 50 tons. Type B discharges the compressed refrigerant gas to some separately located condenser. Type C is complete with a water-cooling shell and coil condenser.

Forced feed lubrication is used on all units of 10-ton capacity and larger. On the smaller unit, the splash system lubricates all bearing steels and cylinder walls.



The pressure switches used are adjustable both for the high pressure and low pressure cut-out points. Pressure relief valves are included.

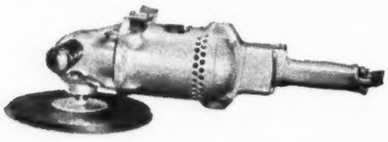
The condenser, which is a part of the Model C reciprocating compressor, is of the shell and finned coil type. It incorporates a Trane nonferrous extended surface coil — mechanically bonded, fin-to-tube construction. These condenser coils are cleanable, while the water box, which is both cleanable and removable, permits the use of varying water temperatures and quantities through different distribution arrangements.

Trane Bulletin DS361 thoroughly describes these compressors.

◆

136—Heavy-Duty Sander

The Black & Decker Mfg. Co., Towson, Maryland, has developed a new heavy-duty sander, designed for con-

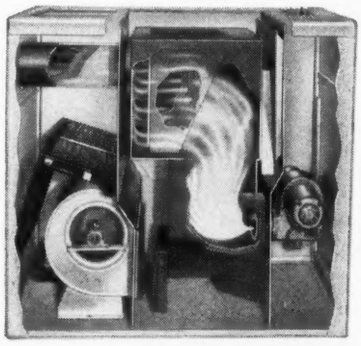


stant production-line use with 9-inch abrasive discs, for metal surfacing.

Features include a sturdy, full-powdered Universal motor, either A. C. or D. C., and a new spindle-lock for quick disc changing.

137—Gilco Series "L"

J. L. Gillen Company, Dowagiac, Michigan, announces the "L" Series Gilco oil burning furnaces with 100,000, 150,000 and 200,000 Btu output at the register, featuring a flange mounted burner, prefabricated rectangular combustion chamber, cham-



ber drawer, heavy boiler plate steel heat exchanger, fully insulated inner-liner, split stack connection, clean-out door, filters, and blower.

The outer casing is finished in aluminum grey Hammerloid enamel.

◆

138—Oil Conditioner

The Heil Company, 3000 W. Montana Street, Milwaukee, has put on the market a new automatic oil heating unit, designated for the small home. Model F-80 Heil Activ-Air

conditioning unit is contained in a hammered copper steel jacket 26 x 46 by 57 inches high, and is rated at 80,000 Btu per hour.

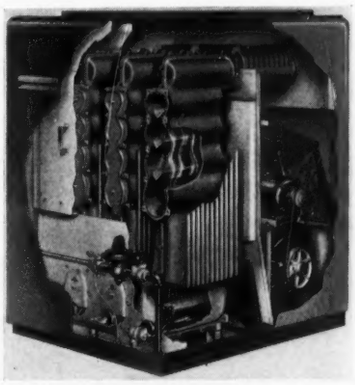
The Heil burner consumes an average of one gallon per hour, and a float-controlled humidifier diffuses approximately one-fourth gallon of water an hour. The F-80 is operated by a ¼ h. p. motor.

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 103.

139—Mohawk Gas Conditioner

American Radiator & Standard Sanitary Corporation, Bessemer Bldg., Pittsburgh, announces the Mohawk gas-fired winter air conditioner, housed in a two-tone blue jacket.



The Mohawk in nine sizes with inputs ranging from 60,000 to 300,000 Btu per hour is completely automatic.

The heating element is built of rugged, durable cast iron, in two sections. The faces are surface ground, packed with asbestos wicking and then bolted together.

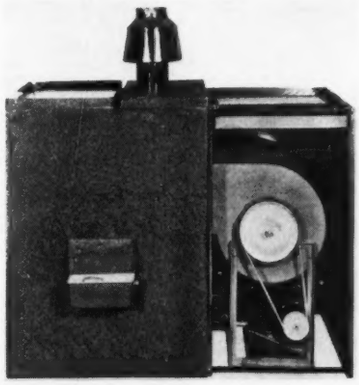
The return air is pre-heated before entering the heating compartment, by means of finned radiators or cast iron collars (depending on the size of the unit) which are placed in the return air compartment.

The burner is made of cast iron with patented high temperature alloy, corrugated ribbons.

◆

140—Venturi Tube Radiator

The Coroaire Heating Corporation, 1422 Euclid Avenue, Cleveland, has patented the Coroaire Venturi Tube radiator or heat exchanger which results in faster air flow with minimum resistance.

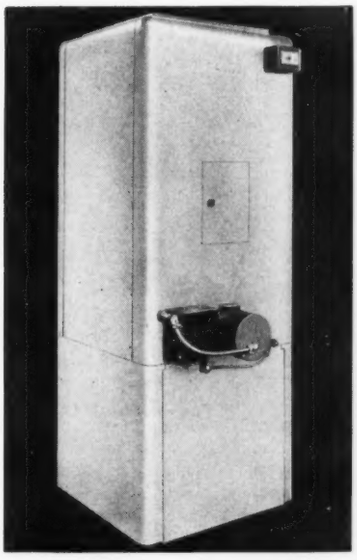


The theory is that as the air to be heated and conditioned is forced through these tubes by the fan, it takes on a swirling motion.

141—Oil-Burning Furnace

Norge Heating & Conditioning Div., Borg-Warner Corp., 670 E. Woodbridge St., Detroit, announces the new Norge Model OD-70 oil burning furnace for defense homes.

Features include a two-stage, mechanical draft, pressure vaporizing oil burner. Model OD-70 is 26 in. square and 67 in. high and is



equipped for forced air circulation. It develops 70,000 Btu at the bonnet and delivers 800 cfm. Inlet is at the bottom or side, discharge at the top. It is completely wired and comes as a "package." All controls are fully automatic. Finish is pearl gray enamel, baked on in infra-red light ovens.

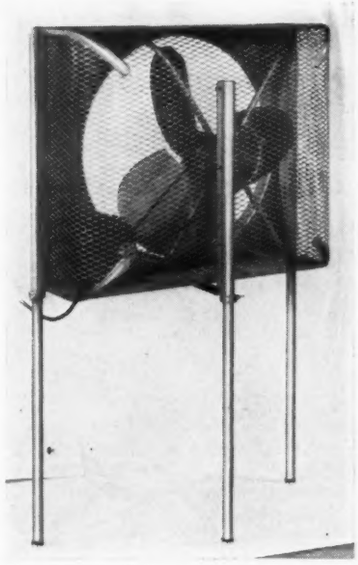
◆

142—Gas Conditioner

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., announces a new gas-fired air conditioning unit especially designed for year-round use in the home where space is limited. This type GV-90 unit is rated for an input of 90,000 Btu per hour and an output of 72,000 Btu per hour, with a capacity of 900 cfm at ¼-inch static pressure. The overall height is 64 inches with base dimensions 28x30 inches.

Return air may be brought in the top or the bottom of the unit. The 12-inch blower wheel, driven by a 1/6 hp motor is placed below the heating element. Both burner orifice and air openings are adjustable.

The standard unit is fitted with filters, humidifiers, and standard control equipment.



•143—Portable Window Fans

The Lau Blower Company, 2001 Home Ave., Dayton, Ohio, announces a line of Niteair room cooling fans with adjustable legs for small homes, apartments and stores. Model 226-A produces 3200 cfm while model 226-B produces 4000 cfm.

The adjustable legs can be easily attached to the grille of the unit on the front and sides. The leg sockets are so made that they can easily be attached so that the unit can be set up with its wider side horizontal to the floor. For narrow windows, the legs are mounted so that the narrow side is horizontal to the floor.

Niteair room cooler weighs only 50 lbs. with grille and 5 in. window spacer. The spacer panel makes the fan width adjustable from 29 to 34 in. to fit any window. The spacer is used when the fan unit is mounted in the window frame, without the adjustable legs. For narrow windows 29 down to 24½ in., the fan may be installed using the 24½ in. side as the base.

The use of the adjustable legs enables the user to move the fan more easily from room to room. Fan legs add 12 lbs. to the weight of the fan. Fan is wired for plug-in connection. Window fan, protective safety grille, window panel and adjustable legs are in arrow-flint hammered gray finish.

◆

•144—Anti-Spatter

Thompson & Company, P. O. Box 6757, Pittsburgh, has developed "Anti-Spatter" where the weld is to be neat and free from spatter. Anti-Spatter prevents the adhesion of any spatter to the surface.

"Anti-Spatter" is intended for jobs that are to be pickled, and also for where there is no pickling and the work is to be painted over. SO 317, Pickle-Off, is used where the job is to be pickled. SO 327, No-Clean, is applied where the work is not to be pickled. It provides a firm surface for all paint.

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 103.

145—Screw-Thread Copper Nail

W. H. Maze Company, Peru, Illinois, is introducing a new "threaded" solid copper nail, trade-named the "Maze-Made Screw Thread," recommended where wind conditions put a strain on slate or asbestos roofing, sheet metal cornices and valleys, etc. The new nail derives its holding power from "threads" on the shank which imbed themselves in the wood.

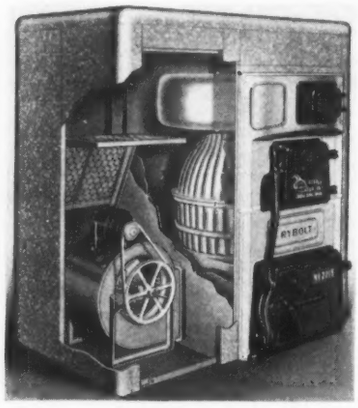
The Maze-Made Screw Thread copper nail is available in a full range of sizes packaged in 5 pound cartons.

◆

146—Coal Conditioner

The Rybolt Heater Company, Ashland, Ohio, has placed on the market a new cast iron coal fired winter air conditioner — Series 151. Basically this is the old Series 157 redesigned and modernized with new features. One of these is the full height reversible blower cabinet.

The cabinet is built of smooth 20-gauge steel with rounded corners. The heating chamber is well insulated



through the use of double linings shaped diagonally at the corners to equalize the air space. The casing is finished in lustrous gray hammerloid enamel. The furnace front is of heavy cast iron. The heating element is the Series 15 cast-iron coal-fired furnace with extra large duplex ball-bearing grates; waist-high shaking lever; slip-on front casting; one piece radiator, dust-and-gas-tight with new type clean-out door; effective smoke consumer on feed door; ashpit and feed doors which are surface ground for close fit; extra weight for greater strength and maximum heat power.

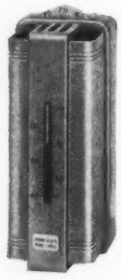
Standard equipment includes inner casing baffles; blower with top mounted motor and variable speed pulley; thermostatic blower switch (M-H type LA-412-A); and Dust-Stop filters.

Btu at register: 88,000, 108,000, 127,000 and 148,000.

147—T81 Acratherm

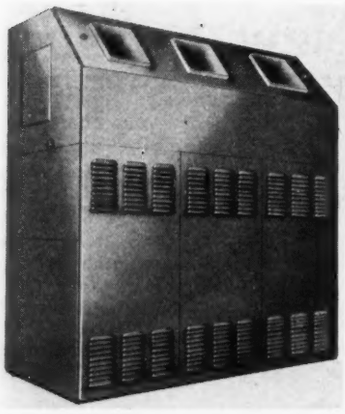
Minneapolis-Honeywell Regulator Company, Minneapolis, announces a new low-voltage room thermostat for use in controlling low voltage two-wire type valves and motors.

It is similar in design and appearance to the Series 10 Acratherm except that the S. P. S. T. snap action contacts are used to permit control of two-wire devices.



Accurate control is assured through the use of an artificial heater and an unusually sensitive bi-metal actuating element. The differential is adjustable and contacts are of ample capacity for low voltage loads.

The Acratherm has a silver finish and is furnished with a detachable mounting plate to facilitate installation. At no extra cost, the Acratherm may be equipped with a locking cover to guard against tampering and a positive night cutoff to prevent any operation of the heating plant during the night. Standard range is 54 to 86 deg. F.



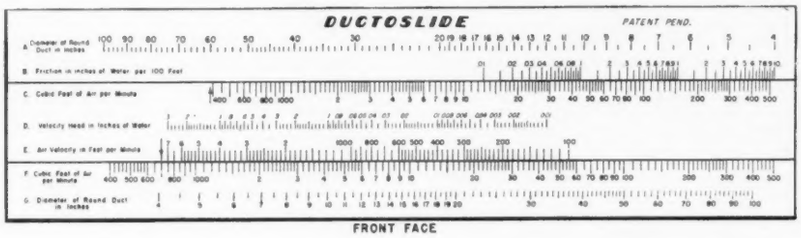
149—15-ton Conditioner

The Trane Company, LaCrosse, Wisconsin, announces a new 15-ton self-contained air conditioner which may be arranged in a regular central system incorporating an evaporative condenser. Only simple duct work arrangements are necessary.

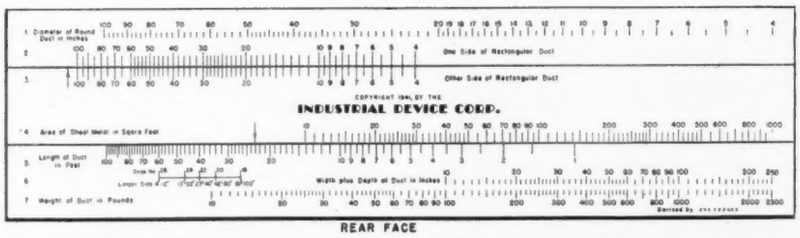
The unit includes three 12-in. DWDI fans, a Trane reciprocating compressor, a DE cooling coil, a spray-type humidifier and has provision for the inclusion of a heating coil if such is desirable.

Fresh outside air as well as recirculated air can be introduced through the unit. The discharge connection is designed at a 45 deg. angle, permitting duct connections to be made directly with 45 deg. angles in the supply duct for either horizontal or vertical travel. Individual 45 deg. duct turns are provided, should they be required.

Trane Bulletin DS-362 completely describes. Dimensions are 85⅛ in. length, 36⅝ in. width, and 83 11/16 in. height.



FRONT FACE



REAR FACE

△148—Ductoslide

Industrial Device Corporation, 501 Fifth Avenue, New York City, offers the Ductoslide for the calculation of air conditioning and ventilating design problems.

Ductoslide is a slide rule developed by Zvi Gezari and is intended for use by engineers, contractors, etc. The slide rule consists of seven scales on the front face and seven scales on the rear face.

The Ductoslide may be used to design air distribution systems either by friction, velocity or other method.

Where trustworthy tools are vital

Photo courtesy of The White Motor Company

Bog or marshland . . . mud or water . . . tough going can't stop these newest U. S. Army Half-Tracs. They climb in and out of shell holes and trenches that would worry an old-time cavalry horse. They speed fifty miles per hour over smooth ground and highways. Experts say they surpass anything that the war lords of Europe have yet devised. And in their tool kits you'll find Crescent Wrenches, just as you will wherever trustworthy tools are vital!

Crescent Tools include adjustable wrenches, pliers of all types, hacksaws, snips, screwdrivers, etc., etc. They are sold under the "Crescent" and "Crestoloy" trade names by hardware dealers and industrial distributors everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

YOU CAN ALWAYS DEPEND ON

CRESCENT TOOLS

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 103.

150—Oilifter

Automatic Products Company, 2450 N. 32nd St., Milwaukee, has designed the 1941 Model 246 Oilifter with an operating capacity of 2 gallons per hour at a 25-foot lift.

The Oilifter runs intermittently—starting when the operating float drops to a set minimum oil level and stops when it rises to the maximum operating level.

A wall bracket is supplied with each unit. The vane type rotary pump is operated by a slow speed motor mounted in oil resistant rubber and is flexibly connected to the drive shaft.

△151—Comforteer Gas Furnace

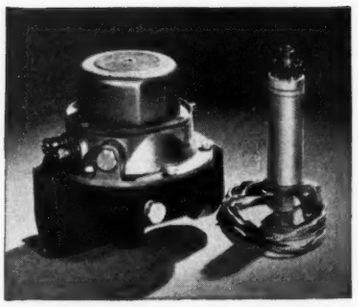
Air Conditioning Equipment Co., Douglas Ave. at Waco, Wichita, Kansas, offers the Comforteer triplex gas furnace for houses with or without basements, as a successor to the floor furnace (in the same price class.)

In this modernized furnace, the main heat register is smaller than the register of the same capacity floor furnace. Two cold air registers are used—located near the outside walls. The return air case at the side of the furnace cabinet serves as a blower housing when the system is converted to forced air or air conditioning—by the addition of a heat impellor or centrifugal fan. A sheet metal plate on under edge of joists forms the cold air duct.

Humidifying trays and curtain wicks maintain humidity.

An additional heat pipe and baseboard register—or pipes and registers up to four—may be installed.

Floor furnace type controls for the main burner and pilot burner may be operated from the main heat register. Thermostatic controls of all standard types are available.



152—Improved B-60

General Controls Co., 801 Allen Avenue, Glendale, California, announces four improvements in design of its B-60 gas valve introduced three seasons ago to provide automatic gas heating for floor furnaces, gas furnaces, boilers and industrial application, without electric current.

The cover has been made more compact and tamper-proof. Its integral pilot valve assembly has been simplified and eliminates external gas ways—it has a rigid vent connection. The new B-60 valve bodies are made stronger by use of hi-tensile iron; seating pressures have been increased. Binding posts are securely locked in casting to prevent turning; terminal connections may be made secure.

All necessary operating current, approximately 250 millivolts (¼ volt) is supplied by the pilot generator, making for an all-gas installation.

Put Money in the Bank
WITH "BANKHEAT"

Now is the time to sell Commercial and Residential owners on the wisdom and economy of modernizing old wasteful plants by converting them to Oil with the world famous Johnson "BANKHEAT" automatic Pressure Type Oil Burners.

This will put money in YOUR bank while giving your customers a big return on their investment in a lifetime of trouble-free performance. The convenience, cleanliness and simplicity of this Burner is amazing.

Easy to install either pedestal mounted (as shown) or fastened directly on the firebox. Fits most boiler bases. Easy to service. Available in five sizes from .8 gallon per hour minimum to 15 gallons per hour maximum.

Get full details from

S. T. JOHNSON CO.
940 Arlington Ave., Oakland, Calif.
401 N. Broad St., Philadelphia, Pa.

FOR DEFENSE

BUY A SHARE IN AMERICA

The new United States Defense Savings Bonds and Stamps give all of us a way to take a direct part in building the defense of our country.

This is the American way to provide the billions needed so urgently for National Defense.

★ United States ★ DEFENSE SAVINGS BONDS and STAMPS

THIS MESSAGE IS PUBLISHED BY US IN THE INTEREST OF NATIONAL DEFENSE

KEENEY PUBLISHING COMPANY
6 North Michigan Avenue, Chicago, Illinois

For Prices and Deliveries on

Blower-Filter *Units*

So far USAirCo has been able to meet its defense contract requirements without impairing service to the trade on blower-filter units.

An enlarged plant, plus the extra blower capacity released by the usual seasonal curtailment of cooling equipment production, is making this possible.

Now is the time to take advantage of the *present favorable delivery and price situation.* Growing defense needs may change the picture overnight.

Immediate action is advisable, if you hope to fortify your own heating, cooling and ventilating needs.

Write USAirCo *today!*

UNITED STATES AIR CONDITIONING CORP.

Northwestern Terminal
Minneapolis, Minnesota

USAirCo., N. W. Terminal, Minneapolis
Send data on items checked to:

Blower-Filter Units ☐
Ventilating Blowers ☐
Exhaust Blowers ☐ .....
Cool'g & Heat'g Coils ☐
Deflecto Grilles ☐ .....
Warm Air Registers ☐
Room Humidifiers ☐
Cooling Equipment ☐ Jobber's Name .....

USAIRCO Air Conditioning EQUIPMENT — YOUR BEST AIR DEFENSE

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 103.

191—Electric Tool Catalog 45

Wodack Electric Tool Corporation, 4627 West Huron Street, Chicago, is distributing Catalog 45 covering their electric tools for construction, installation, production, and maintenance—drills, hammers, sanders, grinders, edgers. There are 8 pages, with the final page given to accessories for Wodack electric tools.

◆

192—Clean-Up Cost of Welding

Thompson & Co., P. O. Box 6757, Pittsburgh, is distributing an envelope stuffer describing Anti-Spatter—a compound to be brushed, sprayed or wiped along the edges to be welded and over an area extending six to eight inches from the weld. Anti-Spatter prevents the adhesion of any spatter to the surface.

◆

193—Album of Space Heater Selling

Automatic Products Company, 2450 N. 32nd St., Milwaukee, has designed the 1941 A-P Album of Space Heater Selling. The album contains many mechanical points brought down to customer advantage. The booklet gives a complete story of all A-P oil controls as well as all of the electric and automatic conversion units that give the benefit of completely automatic heat.

Part of the book is devoted to quickly answering some of the common questions that may be in the mind of the buyer and of great importance is the visual prospect chart which shows the retail salesman where he can sell more oil-burning appliances for the retailer.

◆

194—Pipe and Fittings Catalog 35-C

Milcor Steel Company, Milwaukee, offers heating dealers and contractors, Catalog 35-C showing their improved system of prefabricated gravity and forced air fittings and accessories.

The catalog gives list prices, specifications and illustrations on Lockjoint and Titelock gravity heating fittings, furnace pipe, registers and accessories, and forced air pipe and fittings.

An addition to the catalog is a new section devoted to stove pipe, Airtite heaters, bake ovens, coal hods, and the complete Milcor ventilator line, including new types of Milcor Louvre ventilators.

◆

195—Handbook on Contour Sawing

Continental Machines, Inc., 1301 Washington Avenue South, Minneapolis, offers a revised handbook on contour sawing.

The Handbook contains information on the art of contour sawing and its application. There are 158 pages devoted to illustrations and guide charts covering all phases of contour sawing and filing of metals to any desired shape. Contour sawing in comparison with other machining processes such as the shaper, nibbler, lathe, miller, and torch cutting is made in the first section of the book. Section two illustrates application and work accomplished by contour sawing. Section three gives a short resume of machine tools and their direct effect on our standard of living.

The book is bound, indexed and covered in textbook style. The pages lie flat at any opening.

◆

Consumer Literature

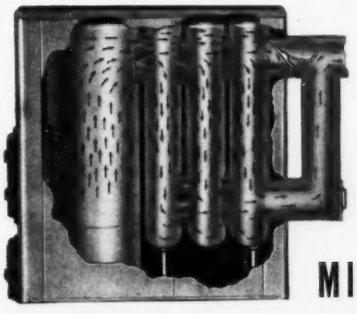
Stationary Louvre Ventilators—How the Milcor louvre solves the vital ventilation problem is told in an envelope stuffer being distributed by Milcor Steel Company, Milwaukee, who now offer thirteen different models in three series. Architectural reasons for louvre ventilators are given, as well as the advantage of steel. Installation diagrams are included. Coupon No. 196

Leader
TRADE MARK

KOOLSTACK FURNACES
Put MORE Heat to Work!

Patented automatic damper diverts hot gases through economizer sections until every possible unit of useful heat is surrendered.

The KOOLSTACK principle is based on a natural law . . . mechanically simple . . . nothing to get out of adjustment.



NOTICE

How the patented automatic damper prevents escape of hot gases.

MINIMUM FLY ASH

The KOOLSTACK principle gives LEADER dealers MORE to talk about . . . MORE to sell!!

Available in BOTH cabinet and round cased types.

HAND FIRED . . . STOKERS . . . OIL BURNERS

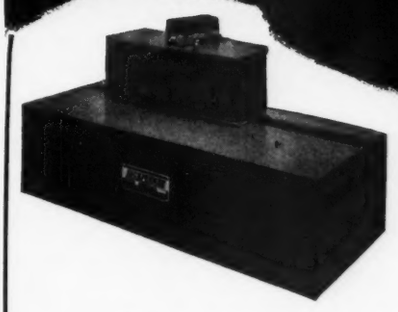
Other advantages to set the Koolstack dealer apart from any on the market —First: Easily installed, even in close places. Every part will clear a 31" opening. Second: Koolstack furnaces are of all welded construction, permanently gas and smoke tight. Third: There is a Koolstack for every operating load from 50,000 to 200,000 B. T. U.'s.

WRITE TODAY

LEADER IRON WORKS INC.
DECATUR ILLINOIS
2841 NORTH JASPER ST.

One Fitting Short?
MAKE IT RIGHT ON THE JOB!

A LOCKFORMER 24 AND A PAIR OF SNIPS IS ALL YOU NEED.



One man can carry a Lockformer 24 easily—yet this compact machine, plus a pair of snips, literally "Brings the shop right to the job!" . . . lets you make the needed fitting in less time than it takes to send the truck for one.

DOES BOTH JOBS WITHOUT CHANGE-OVER

With the Power Flanger Attachment, this portable machine is *always* set up for two jobs—making Pittsburgh Locks and making Right Angle Flanges. There are no rolls to switch, nothing that requires even an adjustment. And since no time is lost "changing over," the 24 is practical even when only one fitting is needed.

OPERATE IT YOURSELF

Plug the 24 into the nearest electrical outlet, click the switch and start feeding metal. If you've never operated a Lockformer before, you're in for the surprise of your life. If you're already using a larger Lockformer model in your shop, you'll find a 24 will help you cut costs still further by giving you one machine for the shop, one for the truck. *Send the coupon today.*

Lockformer Company
4615 W. Arthington St., Chicago, Ill.
Gentlemen: ( ) I'd like a demonstration — ( ) Send me more information.

Name .....

Address .....

City ..... State.....

THE LOCKFORMER CO.
4615 ARTHINGTON STREET, CHICAGO, ILLINOIS

FLUSH TYPE

BARBER-COLMAN

venturi-flo
AIR
DIFFUSERS

SURFACE TYPE

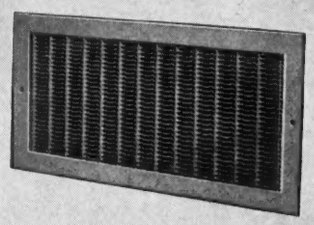
Guaranteed
PERFORMANCE

Because *results* are what count, Barber-Colman Air Distribution Units are backed by a guarantee, not only that materials and workmanship are of high quality, but also that the specified conditions of air movement and temperature gradients will be met to the customer's complete satisfaction.

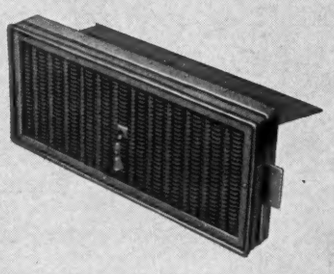
Engineered
AIR DISTRIBUTION

This guarantee of *results* is possible because Barber-Colman Air Distribution Units are recommended on the basis of comprehensive laboratory and field research data and can be accurately engineered to fit exactly the specified conditions, with assurance that they will perform according to specifications. For details on the wide variety of units that are available, please write for descriptive literature.

MODEL "E" GRILLE

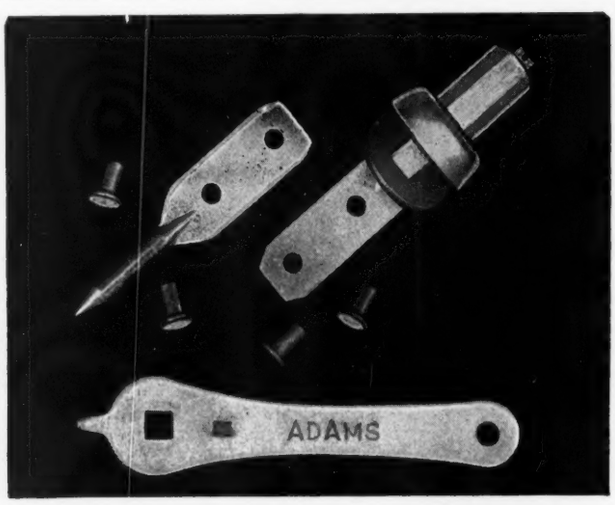


uni-flo
GRILLES and REGISTERS



MODEL "F" REGISTER

1226 ROCK ST. **BARBER-COLMAN COMPANY** ROCKFORD, ILL.



No. 101—¼-inch No. 202—⅜-inch No. 44—¼-inch No. 33—¼-inch (Without Handle)

ADAMS DAMPER REGULATORS (Cadmium Plated)

The nut on the operating bearing holds the damper blade firmly and securely in position so it will not move or rattle.

Also on the No. 101 and 202 Styles the nut locks the blade in position by keeping the projection on the regulator handle in the desired groove on the dial.

No. 101 and No. 202 Adams Damper Regulator

Consists of

1 Dial	1 Operating Bearing
1 Regulator Handle	1 Tail Piece Bearing
1 Nut	1 Washer
4 Rivets	2 Sheet Metal Screws

Packed in Individual Packages
No. 101—12 in a box. 12 Boxes (or 144 Regulators) in Carton.
No. 202— 6 in a box. 6 Boxes (or 72 Regulators) in Carton.

No. 44 and *No. 33 Adams Damper Regulator

Consists of

1 Operating Bearing	1 Cup Washer
1 Tail Piece Bearing	1 Nut
*1 Regulator Handle	1 Flat Washer
	4 Rivets

*In No. 33 Regulator Handle is Omitted

Packed 12 in a box. 12 Boxes (144 Regulators) in Carton.

Manufactured by THE ADAMS COMPANY Dubuque, Iowa, U. S. A.
Established 1883

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 92.

197—Quickwork-Whiting Rotary Shears

Quickwork-Whiting Division, Whiting Corporation, Harvey, Illinois, is offering the first of a series of new catalog bulletins on Quickwork equipment—eight pages 8½x11 inches with space for dealer imprint—covering rotary shears with capacities up to 1 inch mild steel. This is Unit QW-100.

◆

198—How to Make a Dream Come True

Owens-Corning Fiberglas Corporation, Toledo, is distributing two pieces of literature entitled "How to Make a Dream Come True." Both picture and describe the sales and advertising help available—envelope stuffers, newspaper mats, postcards, card files, blower labels with date of Fiberglas Dustop filter installation, advertising in popular magazines, window posters, schedule for promotion efforts, and radio scripts.

◆

199—Stainless Steels in Elementary Discussion

Allegheny Ludlum Steel Corporation, Pittsburgh, is distributing a 32-page booklet, prepared as a companion piece to "Tool Steel—An Elementary Discussion" for the use of classes in metals and metal working. The material in the booklet is not copyrighted and the company invites instructors to make use of it as may seem most helpful.

There are three tables of Stainless Steel Finder giving comparable properties of Allegheny Metal Types, a 4-page chapter on stainless steels, two pages on corrosion resistance, 6 pages on welding, with the balance of the book devoted to drawing and blanking, machining, spinning, upsetting and forging, riveting, shearing, soldering and brazing, annealing and heat treatment, grinding, polishing and buffing, and surface treatment.

◆

200—Arc Welderule

General Electric Company, 1 River Road, Schenectady, N. Y., offers the Arc Welderule—a new time saver in estimating electrode requirements for arc welding by H. O. Westendarp, Jr., Welding Engineer.

Operating in a manner similar to a slide rule, the Arc Welderule reads directly the length of arc welded joints obtainable per 100 lb. of electrode, also the pounds of weld metal deposited per 100 lb. of electrode. The information covers 11 different commonly used sizes and types of joints; also 22 different sizes and types of popular electrodes in both the 14- and 18-inch lengths.

An additional feature of this Arc Welderule is a selector chart which shows the various filler metal classifications as specified by the American Welding Society and the types of electrodes which meet these classifications.

The Arc Welderule is vest-pocket size.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature."
(Circle numbers in which you are interested):

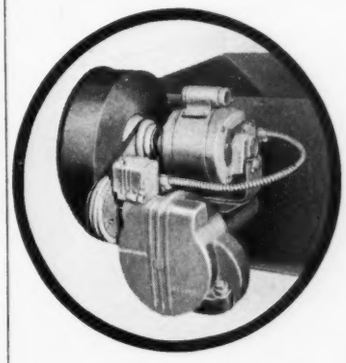
133	134	135	136	137	138	139
140	141	142	143	144	145	146
147	148	149	150	151	152	
191	192	193	194	195	196	197
198	199	200				

Name .....

Company .....

Address .....

Are you Manufacturer———Jobber———Dealer———



ECON-O-COL
WITH EXCLUSIVE NEW
Dynamatic
POWER UNIT

If you have lots of time to spend on service calls . . . if you have lots of money to pay for labor in making adjustments, replacements, etc. . . . if you have lots of customers so the loss of good will cannot affect you—go right ahead and sell "cheap" stokers. But—if your business is rushing . . . if you want to *reap* and *keep* your stoker profits . . . if you want to be in business 5 or 10 years from now—graduate to Econ-O-Col, the precision-built stoker—the stoker that's as trouble-free as human minds and hands can make it! How about it?

BACKED BY A COMPLETE PROGRAM OF HARD-HITTING Selling Helps

WRITE TODAY FOR PRICES AND DETAILS ON MONEY-MAKING 1941 ECON-O-COL DEALER FRANCHISE

ECON-O-COL Automatic COAL BURNER

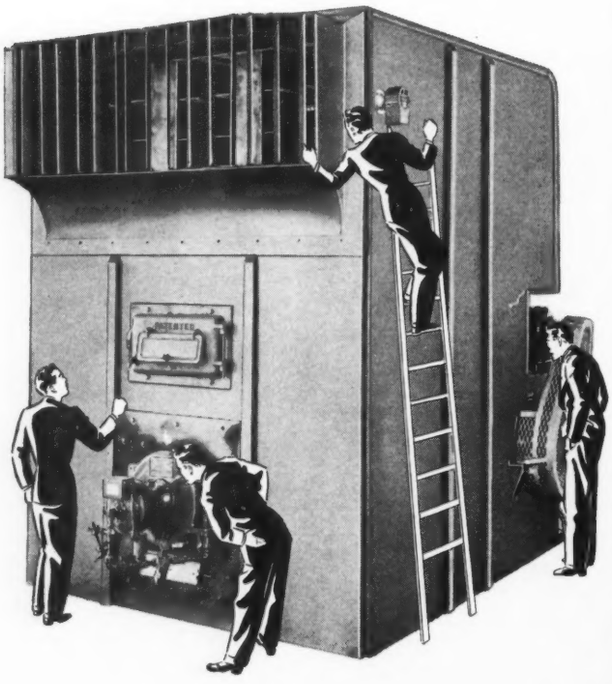
ECON-O-COL

The "Stronghearted" Stoker

MANUFACTURED BY COTTA TRANSMISSION CORPORATION, ROCKFORD, ILLINOIS

THE SHIELD OF QUALITY

The closer you look
The better you'll like it:



DIRECTHERM
HEATER

the direct-fired Unit Heater in 6 sizes (300,000 - 1,700,000 BTU) for plant, office, and shop.

It is a real fuel saver. Whether you burn oil, gas, or coal—it produces about 80% of the invested fuel energy and distributes it evenly up to 200 feet distance. That's heating efficiency!

The Directherm Heater is built to keep your cost down. The first cost is low, the installation simple, and the up-keep negligible, due to the sturdy construction.

Start your saving program today by writing for our bulletin 305 Z. It tells you the whole story.

AIRTHERM
MANUFACTURING COMPANY

706 S. SPRING AVE. ST. LOUIS, MO.

With the Manufacturers . .

Viking in New Location

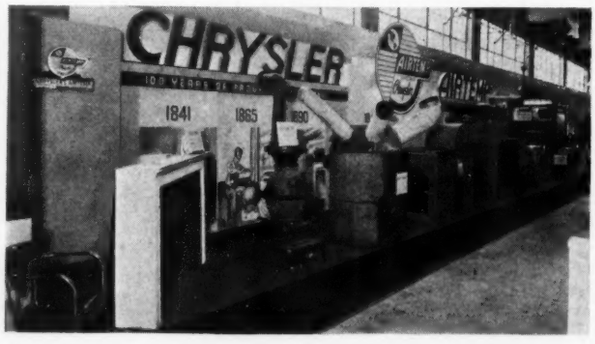
The fire which destroyed Viking Air Conditioning Corporation's factory in June was disastrous but far from fatal. Even before salvaging operations could be commenced the company had set up production lines in several strategic locations, and artisans were producing Viking equipment less than twenty-four hours after the fire.

After August 1 Viking will be in new quarters at 5600 Walworth Avenue, Cleveland, with nearly fifty per cent more space for the production of fans, blowers and humidifiers, and ample provision for still further expansion in the future.

All of the machinery that was not irreparably damaged has been reconditioned, and several new pieces of the most modern equipment have been installed.

The main offices of the company will be located at the same address, and an invitation is extended to readers of American Artisan to inspect the new facilities when in Cleveland.

◆



Airtemp Division of Chrysler Corporation had this exhibit at the Dayton, Ohio, centennial, sponsored by the Dayton Chamber of Commerce recently to mark one hundred years of progress. The Airtemp exhibit shows how heating equipment has progressed from the open fire to the pot-bellied cast-iron stove of Civil War days, to the gravity furnace, to modern air conditioning equipment like the combination Airtemp heating and cooling unit.

◆

Engdahl Joins Battelle

Richard B. Engdahl has joined the research staff of Battelle Memorial Institute, Columbus, Ohio. He has been assigned to the division of fuels research and will assist in an investigation of the use of pulverized fuel for the firing of ceramic and metallurgical furnaces.

Mr. Engdahl is a graduate of Bucknell University and the University of Illinois. He was research assistant and member of the faculty at the latter school previous to joining the Battelle staff. He is a member of the American Society of Mechanical Engineers, the American Society of Heating and Ventilating Engineers, and Sigma Xi, national honorary science society.

◆

Oil-O-Matic Campaign Ties with Defense

Williams Oil-O-Matic Heating Corporation, 1201 E. Bell, Bloomington, Illinois, is launching an advertising campaign which ties in with the "Save for Defense" program negotiated by the oil burner industry. The program includes a jumbo broadside with the complete story of the program, floor displays, wall hangers, window streamers, "Name-a-Day" direct by mail pieces, complete line folders, specification sheets, colorful consumer bulletins, envelope stuffers, letter-head stickers, tabloid newspapers, newspaper ads and the new co-operative defense stamp certificates.

A series of dealer meetings is scheduled for Charlotte, N. C., Philadelphia, New York City, Boston, Indianapolis, Chicago, Des Moines, Minneapolis, Seattle and Portland Maine.

KLAUER *Profit Tips*

NEW CATALOG

AVOID CUT-THROAT COMPETITION

You'll never find Klauer Sheet Metal products in chain stores or catalog houses (not even under another name)! Klauer has always sold *only* through legitimate channels—jobber-to-dealer-to-consumer—protecting your profits, avoiding cut-throat competition! Get this brand-new catalog—line up with this money-making line.

SPEED WORK! SAVE TIME! SATISFY CUSTOMERS! BOOST SALES! CUT COSTS! MAKE MONEY!

JOBBERS! ESTABLISH ANOTHER SOURCE OF SUPPLY

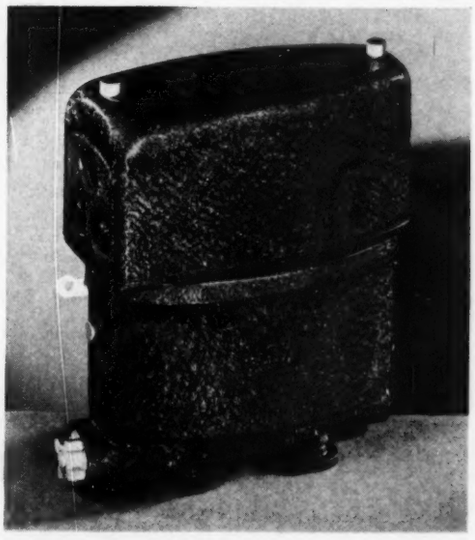
Insure your business—be sure you'll have something to sell! Attractive franchises now open — write today!

Klauer SINCE 1870 MANUFACTURING CO., DUBUQUE, IOWA

- Roofs and Box Gutters, Valleys, Flashing
- Sheet Steel, Corrugated Sheets
- Skylights, Stock Tanks
- Ventilators and Cupolas
- Eaves Trough, Conductor Pipe and Trimmings
- Metal Ceiling, Pressed Siding, Rolled Roofing
- Metal Lath and Corners
- Ridging, Corners, Battens, Shingles

A-P Thermostatic Furnace Control Set —Relay Type.

Defense Spotlights Importance of
Control Dependability



With National Defense calling many experienced service men, Retailers today are finding comfort in the *proven Service-Free* DEPENDABILITY *of A-P Oil Controls.*

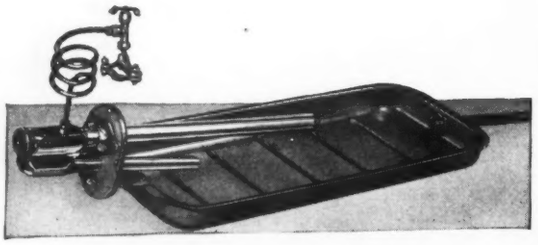
Standard equipment on a majority of gravity fed oil burning Appliance Lines this year, A-P DEPENDABLE Controls *provide valuable advantages, both in sales and service.* For complete information on the controls and their benefits in oil burning equipment selling, write for your copy of the new "A-P Album."

AUTOMATIC PRODUCTS COMPANY
2452 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN

DEPENDABLE *Oil Control Valves*

Want Your Furnace Jobs to Stand Out?

Equip with THERMO-DRIP



STAND OUT furnace jobs can make a lot of difference in a homeowner's attitude toward your competitors. With a reputation for such jobs, you don't have to "pull your punches" to convert bids into sales.

But make no mistake about what constitutes a stand-out warm air job. Remember, your furnace is expected to reproduce NATURAL warmth and comfort. That calls for correctly moistened warm air—not just mechanical or manual filling of water pans, but the addition of moist vapors to the heated air IN DIRECT RATIO to temperature. And it takes a temperature-controlled humidifier to properly balance humidity with temperature.

THERMO-DRIP is that kind of humidifier. The amount of vaporization it produces is governed strictly by the amount of water its temperature controlled feed valve admits to the vapor pan. It's measured moisture!

Include this scientific method of humidification in all your furnace jobs . . . then listen for the tongue-wagging by customers whose furnaces became stand-out performers as a result of this more efficient humidifier.

Ask Your Wholesaler or Write Us for Complete Details

AUTOMATIC HUMIDIFIER CO.
18th and Main Sts., CEDAR FALLS, IOWA

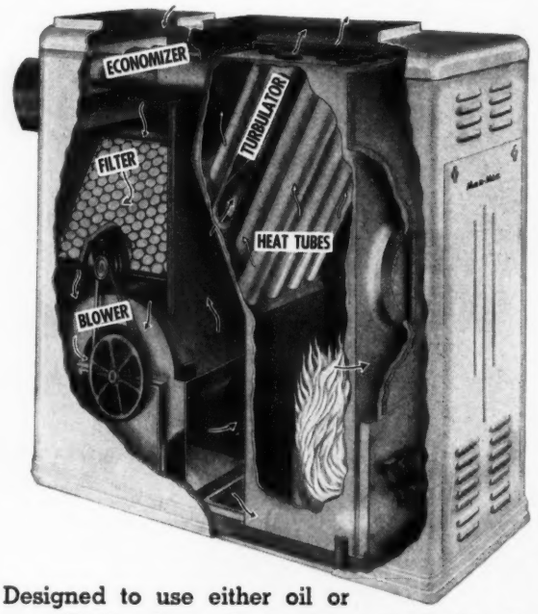
THERMO-DRIP
Automatic **HUMIDIFIER**

Make More Money with MOR-MAC

Regardless of what type or make of heating equipment you now handle, it will PAY YOU TO GET THE FACTS about Mor-Mac Tubular Winter Air Conditioners and the Mor-Mac Direct to Dealer Plan.

For Mor-Mac marks a distinct advance in the science of forced warm air heating. It adapts the time-proved principle of the tubular boiler to a warm air furnace, and the result is the most efficient and compact heating unit now on the market.

In the cut-away drawing below, note particularly the Heat Tubes and the Turbulators. They are important factors in giving Mor-Mac a higher efficiency than any other unit in its size class. Unusually heavy gauge, all-welded steel is used throughout. Complete tooling and die-stamping make assembly easy. Mor-Mac is truly a quality product and yet is PRICED BELOW MOST COMPETITION.

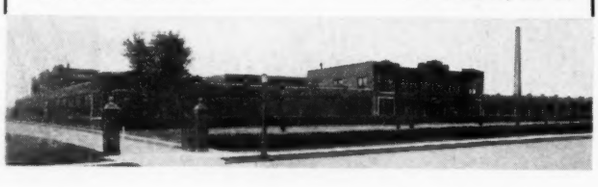


Designed to use either oil or gas. Easily changed over from one fuel to the other, if desired. Your sales insurance!

The Mor-Mac line of winter air conditioners is admirably designed and priced to not only meet the needs for modernization but also the requirements of the unprecedented FHA New Home Building Program. Investigate the MOR-MAC DIRECT TO DEALER PROFIT-MAKING PLAN. Mor-Mac's exceptional manufacturing facilities and large plant capacity are your best protection against delays.

Write or wire today for complete specifications, prices, etc. DON'T DELAY.

MORRISON STEEL PRODUCTS, Inc.
601 AMHERST ST. BUFFALO, N. Y.



With the Manufacturers . . .

Hoyt Airtemp Regional Sales Supervisor

J. E. (Jess) Hoyt, who has been associated with Airtemp Division, Chrysler Corporation, Dayton, Ohio, as special assistant to D. W. Russell, president, has been appointed regional sales supervisor by Paul B. Zimmerman, vice president and general sales manager.

Hoyt will work closely with Airtemp dealers and the company's field organization in the northern region, making his headquarters in Dayton.

◆

Voorhees Now Hall-Neal Sales Manager

G. A. Voorhees, since 1938 with Furblo Company, Hermansville, Michigan, as manager and before that time chief engineer with Furblo, has been appointed sales manager of the Hall-Neal Furnace Company, Indianapolis.

Mr. Voorhees maintained an office as consulting engineer at Indianapolis for a number of years. He has contributed frequently to the editorial pages of American Artisan with engineering design data. He was the author of a long series on converting old gravity systems to forced warm air, and on pre-calculated engineering. He was one of the engineers contributing experience to the Code Committee which wrote all of the various codes of the National Warm Air Heating and Air Conditioning Association. Mr. Voorhees also was author of the Furblo engineering bulletins.

◆

Airtemp Sales Promotion Manager

Henry Knowlton has been appointed as sales promotion manager of the Airtemp Division, Chrysler Corporation, Dayton, according to an announcement by D. W. Russell, president.

Mr. Knowlton will study the application of air conditioning, refrigeration, and heating equipment to selected vocational fields as part of the company's new dealer development and field training program.

For the last four years Mr. Knowlton has been a member of the editorial staff of Air Conditioning & Refrigeration News. During 1939, Mr. Knowlton did preliminary organization work in connection with the National Air Conditioning Association, and has served for the past four years as secretary of the Air Conditioning Association of Michigan. He has been associated with the heating and air conditioning industry for 12 years.

◆

To Prove Automatic Heating Essential

Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., South, Minneapolis, will change the appeal of its national campaign this fall in magazines and on national billboard posters, now devoted to a general selling message, to a specific and timely appeal, emphasizing the double contribution of automatic heating in the present emergency. In other words, Minneapolis-Honeywell advertising will inform of the economy and health value of automatic heating because of its uniform supply and control of heat

Home owners will be urged to have their present heating equipment checked for efficiency and where necessary to install new equipment so that they may co-operate fully with the government in its Defense program.

Minneapolis-Honeywell has prepared and is ready to supply free of charge to dealers newspaper mats, direct mail folders, window and counter display pieces, and radio continuities, all emphasizing the health and economy of modern automatic heating. Most of the pieces are designed to carry the name of the individual merchant or dealer, featuring his own products.

MERCOID
AUTOMATIC CONTROLS
are meeting
AMERICA'S
NATIONAL DEFENSE
CONTROL
PROBLEMS

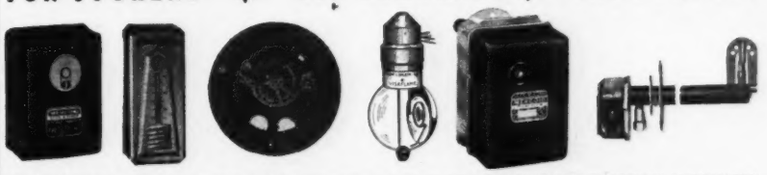
IT HAS BEEN PUBLICLY STATED THAT THERE IS SCARCELY AN INDUSTRY IN THE COUNTRY THAT IS NOT USING A MERCOID CONTROL SOMEWHERE

Most are on vital applications in the control of temperature and pressure; also on automatic mechanical operations. • The time proven accuracy and dependable operation of Mercoid Controls make them indispensable during this time of National Emergency.

WAR ON WASTE

is essential when the Nation's man power and resources are engaged in the important task of building up a strong national defense. Mercoid Controls are especially suitable for carrying on a successful "war on waste" program wherever automatic controls are involved. They are built to endure and practically require no service attention after they are once installed.

FOR STOKERS ✱ OIL BURNERS ✱ GAS BURNERS



MERCOID HAS PIONEERED THE DESIGN AND DEVELOPMENT OF CONTROLS FOR DOMESTIC AUTOMATIC HEAT, AND TODAY THEY ARE FOUND IN TENS OF THOUSANDS OF HOMES THROUGHOUT THE COUNTRY

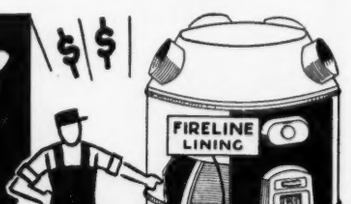
MERCOID HERMETICALLY SEALED MERCURY SWITCHES ARE USED EXCLUSIVELY IN ALL MERCOID CONTROLS

The initial cost is slightly higher than the average type of switches used in controls, but they save on the elimination of service expense, as there is infinitely less chance for contact trouble. They assure longer control life. • A Mercoid switch cannot be affected by dust, dirt or corrosion. • First illustration above, is a new light operated switch—the Mercoid Visaflame. This device has revolutionized the control of domestic and industrial oil burners. The second one shows the snap-action tilting type. Last one, the magnetic stationary type. • Mercoid switches are extensively used in many applications. • For further information see Mercoid catalog.

THE MERCOID CORPORATION • 4207 BELMONT AVE. • CHICAGO

Showing the complete sheet metal shop in a modern vocational school equipped with Niagara machines. Students receive their training on the same kind of machines which they will use when they graduate into industry. Niagara Machine & Tool Works, Buffalo, N. Y. Branches: Leader Building, Cleveland; General Motors Bldg., Detroit; 50 Church St., New York.

MODERNIZE OLD FURNACES and make extra PROFITS!



FIRELINE TRANSFORMS OLD CRACKED, WORN-OUT FURNACES INTO MODERN, REFRACTORY-LINED, EFFICIENT UNITS IN A FEW HOURS, WITHOUT TAKING DOWN FURNACE

INSTALLED THROUGH FURNACE DOOR IN FEW HOURS

Here is a way to make extra profit and line up new prospects for new furnaces, both at the same time. Tell your customers how economical it is to modernize their old furnace and repair that cracked firepot, and you'll make more sales in less time.

More Heat—Less Fuel

A Fireline firepot converts an ordinary heater into a modern furnace. The refractory lining raises combustion temperature, increases the heat-producing capacity, eliminates smoke, soot and gas, and reduces ashes.

REPAIRS Cracked Firepots!

No need to buy expensive castings and take down the furnace. Fireline provides full protection and greater efficiency for any furnace. You make more per hour and get a satisfied customer.

SEND FOR FURNACE PROFITS PLAN } GET IN ON THIS NEW METHOD OF MAKING EXTRA FURNACE PROFITS

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury St. Chicago, Illinois

With the Manufacturers . .

Penn Series of Control Schools

N. E. Jennison, manager of the Atlanta, Georgia, office of Penn Electric Switch Co., has just completed a series of seven educational meetings on automatic controls in cooperation with equipment jobbers in the southeastern part of the United States.

These meetings were devoted to the selection, installation and adjustment of automatic control equipment for heating and air conditioning service. Demonstrations were made with Penn's operating system display hook-up and supplemented with slide films illustrating various points regarding application and adjustment of controls.

Meetings were held at Nashville, Chattanooga, Atlanta, Montgomery, Birmingham, Savannah, Georgia, and Columbia, South Carolina.

◆

Freeman Dealer Sales Meeting Campaign

Freeman Stoker Division, Illinois Iron & Bolt Co., 918 S. Michigan Avenue, Chicago, has completed their nationwide schedule of 60 dealer sales meetings in key cities coast to coast. More than 4,000 dealers attended, with an average of better than 70 per meeting.

Meeting highlights were the presentation of new Freeman models—including domestic stokers, a line of new stoker-fired heating plants, and a series of new stoker-fired automatic water heaters; introduction of the new Freeman Fire Stabilizer, and other engineering and construction features; annoucement of the 1941 program of national advertising in Saturday Evening Post, Time, American Home, Better Homes & Gardens, and Popular Mechanics. Radios were given away as door prizes at every meeting.

J. M. McClintock, Freeman General Manager, was in charge of this campaign.

◆

Armco's Advertising History

The story of the consumer advertising campaign, started by the American Rolling Mill Company, Middletown, Ohio, on August 8, 1914, is told in a brochure just published by The Saturday Evening Post in an interesting fashion. The Armco campaign, starting in the Post, marked the first time a basic raw material had ever been advertised in a consumer magazine. This advertising featured a trademark (the Armco triangle), and asked people to look for it on labels that identified the kind of iron used by manufacturers in various products.

Armco, as a rust-resisting iron, was presented to consumers to show dealers that their customers are interested in what is under the "skin."

◆

Branches, Jobbers, and Distributors

Conco Corporation, of Mendota, Illinois, has just announced the appointment of three new distributing organizations to handle distribution of Conco packaged heating equipment on the West Coast. The new distributors include:

1.—The Oakland Sheet Metal & Supply Company, of Oakland, California—to distribute Conco products in the Northern California and Western Nevada territories.

2.—Hughes & Company, Spokane, Washington, who will cover the western Washington and Western Idaho distributing areas.

3.—The Pacific Coast Coal Company of Seattle, Washington, who—through its heating division—will distribute Conco equipment in the Seattle distributing area which covers all the State of Washington West of the mountains.

◆

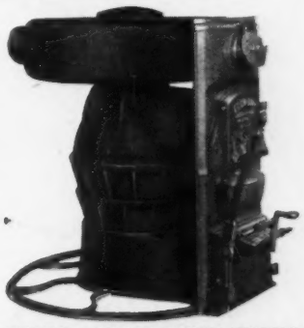
The Research Products Corporation of Madison, Wisconsin, announces the appointment of the following representatives covering the territory indicated:

Campbell-Elsey & Co., 326 Ness Bldg., Salt Lake City, Utah.
State of Utah; eastern part of Nevada; southern part of Idaho.

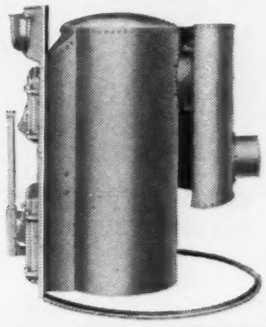
Ernest Wiggs & Associates, 2077 East Fourth St., Cleveland.
State of Ohio.

Gray Engineering Co., High Point, N. C.
State of Virginia.

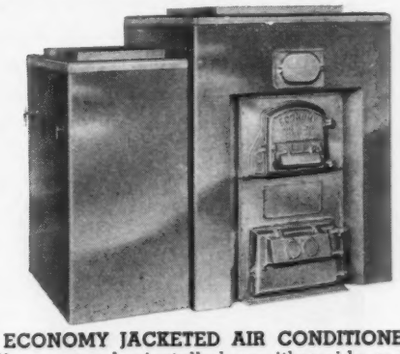
THE OIL ECONOMY "85"
The unit designed for the new type of smaller home complete with oil burner.



ECONOMY BLUE FRONT FURNACE
Available in sizes from 18" to 30" firepot—all rated by National Association.



100 SERIES ECONOMY STEEL FURNACE
Riveted and welded construction. Available in four sizes 20", 22," 24" and 27".

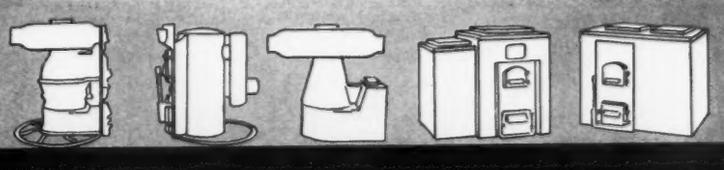


ECONOMY JACKETED AIR CONDITIONER
Blower may be installed on either side or the back—whichever is better for your installation. Built of cast iron.

A Complete Line of Heating Equipment
The International line is complete. In addition to above are units for large jobs for solid fuel and heaters of special design for oil, gas and stoker. Stocks carried with jobbers at all principal points. Write Department A-8 for further information.

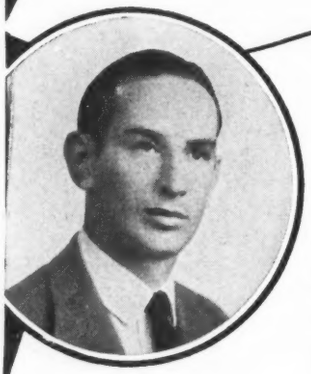
INTERNATIONAL HEATER COMPANY
UTICA, N.Y., U.S.A.

WESTERN OFFICE AND WAREHOUSE • 1933 WENTWORTH AVE., CHICAGO, ILL.
NEW ENGLAND OFFICE AND WAREHOUSE • 110 CHESTNUT ST., NASHUA, N. H.
STOCKS CARRIED WITH WHOLESALERS IN ALL PRINCIPAL CITIES



Premier FURNACE CLEANER

"HALF OUR CLEANING JOBS LEAD TO REPAIRS OR SALES"



"A year ago we bought our first Premier Furnace Cleaner — but one wasn't enough for long. Now each of our cleaners is in use on from 4 to 6 jobs a day—and they're the best prospect-hunters for new business that we have. Approximately 50% of our cleaning jobs lead to repair work of some sort—and the prospects developed in this way have become our top buyers of blowers, miscellaneous controls and other equipment."

Says A. M. Rickel, Standard Engineering Co., Inc., Newark, N. J.

★ ★ ★

Cleaning with Premier's powerful Furnace Cleaner is a one-man job—but it does more than one job for you! Besides cleaning furnaces quickly, thoroughly and profitably, it does double duty by bringing you invaluable leads on new business—either repair work or equipment sales. You should know more about this year-round money-maker, so write today for information—also for the facts about business-promoting post cards that will be a big help to you.

NEW IMPROVED MODELS

Completely Equipped

⅝ H. P. . . . $69.50

1 H. P. $89.50

Complete Chimney Cleaning Equipment Only $9.00.

ELECTRIC VACUUM CLEANER CO., INC.

1730 IVANHOE RD. • CLEVELAND, OHIO

With the Manufacturers . .

Lamneck Employee Wins Essay Contest

John C. Gordon, 38, married, father of two, and a Lamneck Products employee in Middletown, Ohio, was the grand winner in a patriotic essay contest open to all industrial employees of Middletown on "Why I Am Glad I Am an American." Two round-trip tickets to Washington, D. C., was the prize. His essay follows:

"I am glad to be an American, to live in a country founded on the right of man to the freedom of worship, right to liberty and the pursuit of happiness; where the flag of our nation has been followed in battle, in protection of these liberties and not in destruction of civilization; where the government of this land has no 'isms' of hate, greed and the lust for power; where I as an American have right to take part in its government; where there is but one God; where I have the right to home and family; where my children are left to their parental care and rights of childhood; where our education and sports are not controlled by a dictator; where freedom of speech is not a thing of the past; where I can labor as I choose; where I as an American, united with Americans, can defend and maintain the right of liberty and God-given right to peace and happiness."

◆

Penn Boiler in New Factory

Penn Boiler & Burner Mfg. Corp., Lancaster, Pa., manufacturers of oil burners, forced warm air conditioning

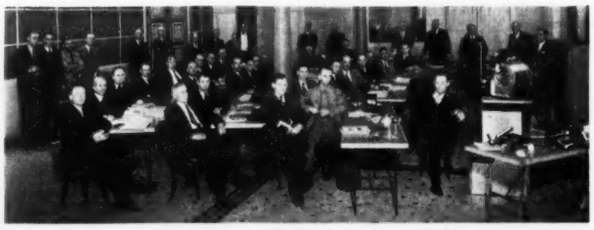
units, and oil-fired water heaters, has recently moved into a new modern factory building.

E. C. Stauffer, president, states that production in the new factory has been doubled.

◆

6th Annual Dealer Meeting

The Salina Supply Company, of Salina, Kansas, recently conducted their 6th annual dealer's meeting. Karl M. Davis, vice president and general manager, reports that 45 of their furnace dealers and sales representatives were in attendance for the day and evening sessions.



Engineering, installation, and servicing were the principal topics under discussion. Cut-away units, as well as working models of furnaces, oil burners, stokers, and automatic controls were shown and demonstrated.

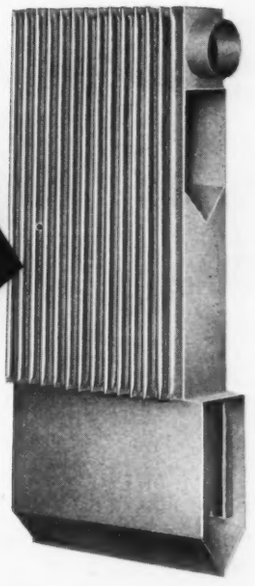
W. F. Ryan, Chief Engineer of Salina Supply Company, arranged all the details of the meeting, and was in charge of the various sessions.

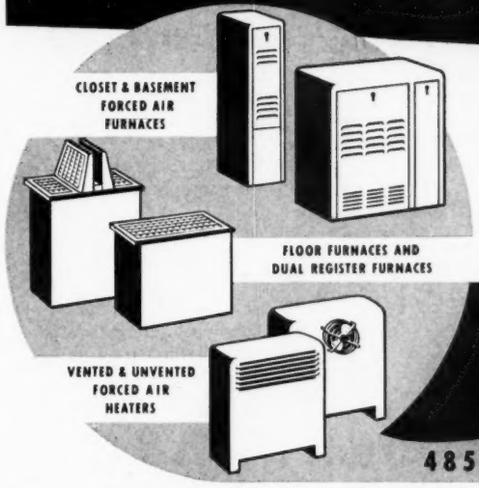
MOST COMPACT DESIGN... HIGH EFFICIENCY... ELEMENT GUARANTEED AGAINST BURNOUT FOREVER

All result from the modern hollow-baffle Uni-Therm element—exclusive in

UTILITY

Forced-air Furnaces





- Other features include specially designed, dynamically balanced blower ...Dust-Stop filters...temperature limit control...automatic blower switch... safety pilot...motor with built-in overload protector...rigid, all-welded steel cabinet.

UTILITY FAN CORPORATION

Los Angeles

4851 SOUTH ALAMEDA ST., LOS ANGELES, CALIFORNIA

NEW FEATURES on SKUTTLE'S 100 HUMIDIFIER

- Evaporating pan 7" wide and available in 4 lengths to fit gravity furnaces of various sizes.
- New rear support is adjustable—no need to cut pipe to length. Tight fitting to prevent air leakage. Collar and rear support will fit on slopes up to 30 degrees.
- Each part selected for long life—pure copper and brass tank and valve assembly.
- Vitreous enameled pan with exposed parts in black wrinkle finish.
- Available in 18", 20", 24" and 30" pan lengths for furnaces with 80,000 to 200,000 BTU capacities.

SKUTTLE *Sales* COMPANY

Air-Conditioning Equipment

1015 FRANKLIN ST. • • • DETROIT, MICHIGAN

AIR IS FREE

But UNFILTERED Air Costs Plenty!

Everyone admits the advantages of filtered air from the health standpoint. But let's consider it from the practical dollars and cents side.

The housewife, for example, appreciates that filtered air, free from dust, grit and soot, materially cuts down her house cleaning time and costs . . . keeps her curtains and draperies clean months longer.

Think, then, what a troublesome problem on a larger scale dirt, dust and soot are to a manufacturer of draperies, curtains and other fabrics. Think of the thousands of dollars saved by air filtration in a textile mill where white, bleached or pastel materials would otherwise be ruined by dust and grit.

Drug and chemical manufacturers depend on air filtration to maintain a high standard of purity for their products. Restaurants and hotels find that air filtration is a factor in holding and building business.

For warehouses and stores air filtration protects stocks of delicate goods against dust and dirt.

Moving picture companies use air filters to keep their studios scrupulously clean and dust-free . . . thus saving vast sums in production costs.

In factories everywhere, air filtration saves thousands of dollars by protecting delicate machinery against dirt, dust and grit . . . reducing wear on moving parts . . . cutting down frequency of shutdowns for cleaning.

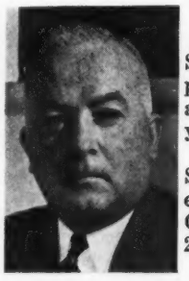
If you have a troublesome dirt and dust problem write us today. Our air filter engineers will make a study and recommend a practical solution.

AIR-MAZE CORPORATION
5130 Harvard Avenue • Cleveland, Ohio

AIR-MAZE
DEPENDABLE AIR FILTERS FOR EVERY APPLICATION

With the Manufacturers . .

Evans Elected President of Skuttle



At a recent board meeting of the Skuttle Sales Company, 1015 Franklin Street, Detroit, A. L. Evans was elected president. Mr. Evans was sales manager and treasurer for the past five years.

Prior to his association with the Skuttle company, Mr. Evans was general manager of the Truscon Steel Company in Walkerville, Ontario, for 22 years.

◆

Personnel Appointments

W. R. Nason—promoted by **General Controls Co.**, Glendale, California, from Houston branch manager to regional factory representative for the states of Kansas, Arkansas, Oklahoma, Texas and Louisiana. Mr. Nason's headquarters will be at 1100 Cadiz Street, Dallas, Texas.

Robert C. Allen, formerly branch manager at Dallas, has been transferred to the Houston office as branch manager, by **General Controls Co.**

◆

Obituaries

Reinhold Sauter, 65, sheet metal worker, native of Germany, resident of Memphis, Tennessee, 42 years, died Thursday afternoon, July 23 at St. Joseph Hospital. His home and shop was located at 371 N. Main Street.

◆

Gustave F. Wolff, 74, senior member and secretary-treasurer of Wolff, Kubly & Hirsig Co., Madison, Wis., died June 12 after a long illness. Mr. Wolff was active in the sheet metal and hardware business in Madison for 40 years.

BARD AIR CONDITIONING UNIT

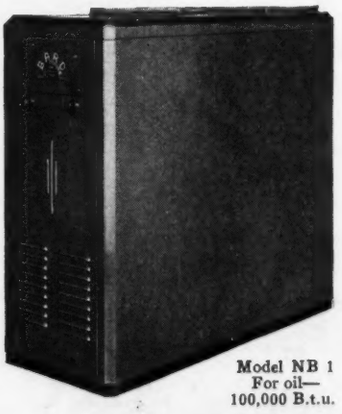
FOR OIL OR GAS!

A complete line of Winter Air Conditioning units from 80,000 to 400,000 B.t.u.

You can PROVE higher efficiency with these units. The features make sense to home owners.

Bard prices "put you in" on both small and large home jobs at a profit.

Write for dealer proposition. Bard owners are Bard Dealers' best salesmen.



Model NB 1
For oil—
100,000 B.t.u.

BARD MANUFACTURING CO.
BRYAN — OHIO

Working the "Wires" To Home Owners

(*Continued from page* 91)

ties of controlling canvassing from the office itself, of reaching those people who simply cannot be reached by canvassers, of knowing that each telephone subscriber is actually reached in the dealer's selling efforts. The development of any easy familiarity with the instrument quickly follows.

Never forget for one moment, however, that the telephone can never be an adequate substitute for good closing salesmanship. It will enable the dealer to control the canvassing of his territory; it will save the salesman the weary drudgery of plodding up to twenty-five or thirty doorways for a chance to get through one of them; even though the salesman makes his own telephone calls, it will double his productivity by at least doubling the time he spends in the actual presence of interested prospects. But it will never actually sell a single installation or even a dollar's work of service.

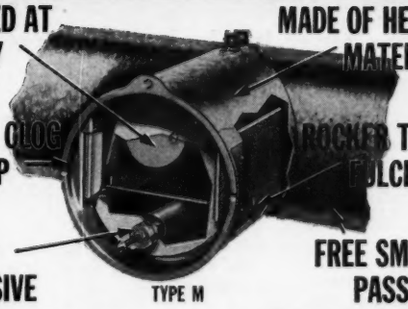
Opening the sale, quickly and effectively, is the appointed task of the telephone in sales work.

Closing the sale still remains the task of thoroughly good personal salesmanship.

THE PATENTED FIELD BAROMETRIC *Draft Control*

BALANCED AT FACTORY

MADE OF HEAVY MATERIAL



DOESN'T CLOG OR WARP

ROCKER TYPE FULCRUM

QUICKLY RESPONSIVE

FREE SMOKE PASSAGE

TYPE M

The most efficient draft control ever designed for constant use year after year. Easily installed—no servicing. In a full range of sizes. Write for details.

TWO MORE OUTSTANDING FIELD CONTROLS

6" TYPE "U"

The Field Control line is complete with the 6" Type "U" control for coal and oil-burning heaters and the motorized Type "M" Control in sizes up to 20". Also a complete line of commercial Controls. Write for literature.

MOTORIZED

FIELD CONTROL DIVISION MENDOTA, ILLINOIS

New Sales Increases FOR THE GEHL STOKER

A Finer Product

Industrial models in various sizes

New Domestic, hopper-fed models in three sizes

Bigger Demand

● Yes, we expect Gehl Dealers to beat that 110% increase of last year. The stoker demand is still growing. New Gehl models offer outstanding improvements.

Gehl Domestic stokers have been redesigned to set closer to the furnace, yet allow extra clearance for the fire door. The rounded corners of the retort are an advantage in furnaces with round fire pots. The Gehl has a heavy, all-cast chassis instead of sheet steel. It gives extra rigidity and resists the rust and corrosion caused by moisture and acids in fuel.

● Stoker Sales are Blowing a Gehl.

Get Going With Gehl

A complete line of domestic, commercial and industrial stokers. WRITE FOR NEW LITERATURE and details of our liberal dealer plan.

GEHL BROS. MFG. CO.

Est. 1867

West Bend Dept. A. Wisconsin

FRONT RANK SERIES "C" FURNACE

There's eye appeal... Customer satisfaction... Profits... in "FRONT RANK"

Since 1888 FRONT RANK Steel Furnaces have made profits for progressive dealers . . . because they satisfy the home owner . . . because they don't require frequent repairs or service.

The Series "C" Steel Furnace is the modern counterpart of the original FRONT RANK. Streamlined in appearance, it adds eye appeal to the efficiency and long life which has made the FRONT RANK known for over fifty years as the furnace "that lasts as long as the house."

Popularly priced, this famous line of furnaces can be sold against any competition.

If you are not handling FRONT RANK, it will pay you to investigate our liberal dealer plan. Write or wire today; no obligation.

A Complete Line of Warm Air Heating Equipment

• Cast Iron Furnaces • Steel Furnaces • Stokers • Registers • Winter Air Conditioning Furnaces • Blowers • Oil Burners

PROFITS TO THE FRONT WITH FRONT RANK

FRONT RANK FURNACE CO.

DIVISION OF LIBERTY FOUNDRY CO.

2500 OHIO AVE., ST. LOUIS, MO.

Procedure For Assigning Priority Ratings

(*Continued from page 76*)

B-2 to B-7 may be "A" or B-1 if it meets the requirements of these classifications.

B-1 to B-7 does not include any specific use properly clasified as B-8.

Warehouses and other suppliers of metals must furnish the producers of metals with information along the following lines:

1. State the article to be made and its application.
2. State the name of the customer or Government agency, and if possible the name of the ultimate user.
3. State any Government Contract Number or specification involved, or any defense priority rating.
4. State your latest acceptable date or dates for shipment from producing plants.
5. State the category (A or B-1 to B-8) applicable to the order. Use separate orders in case your requirements involve more than one category. The categories are as shown above.

◆

Air Conditioning An Animal Hospital

(*Continued from page 66*)

or closes the door to any desired point so graduates air volume accordingly.

When the door is fully open and the fan shut

BARBER

Conversion Burners

Unequalled efficiency and economy on any type of gas fuel.

•

Famous Barber Jets develop 1900° flame temperature on atmospheric pressure.

•

Barber means satisfied customers—minimum servicing.

•

Wide range of sizes, both round and square type burners—all easily adjustable to fit properly ANY furnace or boiler.

Listed in A. G. A. Directory of Approved Appliances. Ask for Catalog and Prices on Conversion Burners, Burner Units for Gas Appliances, and Gas Pressure Regulators.

No. 324—B BARBER BURNER

THE BARBER GAS BURNER CO.

3704 Superior Ave. Cleveland, Ohio

BARBER *Automatic* JET GAS BURNERS

down odors are exhausted by gravity through the ceiling distributors, which then serve as exhaust openings. When the fan is operating odors are forced out of the building through cracks, crevices, doors, windows, etc.

Interior surfaces of the fan pent house including the cooling section, the filter section, all doors (including damper door) are fully insulated with 1¾ in. slab bolted to the sheet metal with large washers under heads. Ceiling insulation is held up by angle iron strips and bolts with large washers.

Furred Duct Insulation

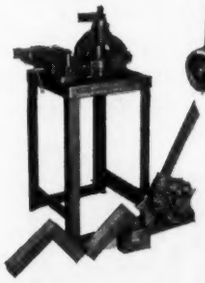
It would be folly to expose sheet metal ducts in such a cooling plant so the contractors covered them with fibrous slab. This was not, however, stuck onto the metal nor wired to it, as is often done, but, rather, is separated from the metal by ¾-in.-thick furring strips made into what might be called a nailing frame. This enabled nailing the insulation to the wooden frame and thus avoids frequently heard criticism that such material has separated from the metal in service. The pocketed air spaces provide extra insulation.

The same general method was followed in insulating the round branch ducts. A square, wooden frame was built around ducts and insulation nailed to the wood. Chinks between insulation slabs

BUY WHITNEY-JENSEN
METAL-WORKING MACHINERY and HAND TOOLS
for LONG LIFE and ACCURACY

"AIR CONDITIONING SPECIAL"
PROVES USEFULNESS IN MANY SHOPS

Specially designed, with 49 in. 20 ga. capacity, for sheet metal duct work. Rollaround Undercarriage for easy moving. Brake units of this series available in plain or combination types, and floor or bench models.

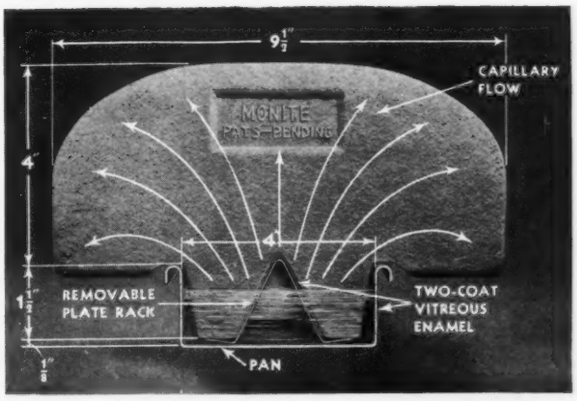


ANGLE IRON COMBINATION
SHEAR - NOTCHER - BENDER

The three tools most-used in fabricating angle iron mounted conveniently on a light-weight, sturdy, welded steel stand. Capacity 2" x 2" x ¼" angles.

Write for Catalog No. 14

WHITNEY METAL TOOL COMPANY
91 FORBES STREET • ROCKFORD, ILLINOIS



MONMOUTH VAPOR DIFFUSING PLATES

THE ORIGINAL VAPORIZING PLATE—Seven years ago their introduction revolutionized humidification. Steadily improved ever since. Widely imitated but never equaled, because Monmouth's long experience and engineering leadership remain unmatched.

SUPERIOR MATERIALS—Made of Monite ceramic material; granular, NOT fibrous. This insures 100% capillarity due to scientifically correct, uniform pore size. Unlike vegetable base plates, they cannot rot or become moldy. Resist iron-melting heat, acids, alkalies.

SCIENTIFICALLY PROPORTIONED — Unlike inferior plates which are punched from thin sheets or sawed from bricks, Monmouth plates are individually die molded. This permits correct cross sectional areas and thicknesses at all points, insuring greatest evaporation and lime holding capacity.

DURABLE AND CONVENIENT—After one to four years' service, lime can be easily washed out with water to which Monmouth non-acid chemical crystals have been added. Restores full capillarity. Can be repeated indefinitely.

LARGEST EVAPORATING CAPACITY—Due to superior materials and proportions, Monmouth plates can be made larger than any others, thus giving from 2 to 8 times more capacity. They give you the greatest evaporating capacity per dollar ever offered.

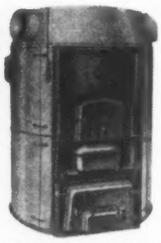
All these and many other superiorities make Monmouth Plates the peer of all humidification plates.

***FREE!* CAPACITY INDICATOR** Handy, pocket-size indicator instantly tells you how many plates any humidification installation requires. Saves time, ends guesswork. Write for YOUR copy NOW.

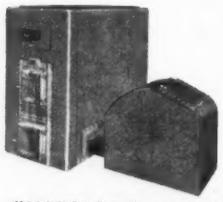
MONMOUTH PRODUCTS COMPANY
1933 East 61st Street—Cleveland, Ohio

MONMOUTH
The Greatest Name in Humidification

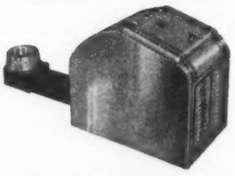
Fall Values FROM ROUND OAK



"J" Blended Iron Furnace a Round Oak gravity unit, famous for quality and superior features. A leader in any locality.



"SPX" Stoker Furnace with side extensions for stoker on either right or left. Complete winter air conditioning. Used with Round Oak stoker or any other standard make.



Round Oak Stoker in several sizes. Efficient, dependable, and priced to sell.

"XB" Oil Furnace performs all functions of heating and winter air conditioning. High operating efficiency; low operating costs. A complete package unit with Round Oak's oil burner.

"S" Boiler Plate steel gravity furnace of welded gasproof construction. Available in all sizes.

BE PREPARED to meet the Fall rush! Stock up with this complete line of *Fall Values* in Round Oak warm air heating equipment... and you'll not only be able to sell to a broader market, but cash in on greater volume and profits, too. Take advantage of Round Oak's 70-year reputation for finest quality. Write for complete facts today!

ROUND OUT WITH ROUND OAK of Dowagiac, Mich.
THE COMPLETE LINE OF FURNACES OIL BURNERS AND STOKERS

were filled with plastic, the entire work was covered with asphalt roofing compound and, finally, sprayed with aluminum enamel. The finished surface is shiny and thus reflects heat.

Yet another feature of this installation is the sound absorbers, referred to by the contractor as "silencers." These were furnished at the request of the owner who objected to transmission of barking and other animal sounds from room to room via the ducts.

To correct the condition, applied thus far to five wards, where most of the objectionable noises came from, the Demuths designed and fabricated five diamond-shaped silencers. They were installed between branch els and branch ducts. The apex diameters of these sound-deadeners is approximately twice the diameters of their ducts. Silencer interiors were lined with ½-in. Duxulation folded snugly against the metal with cleats. An essential design feature also is a special silencing core also designed by the sheet metal contractors.

Incidental features are: use of the waste water for lawn irrigation; refrigeration effect under optimum conditions 11 tons; normal summer cooling of 8 deg. below exterior temperature; maximum temperature of street main water under adverse conditions 75 deg.; average water incoming temperature 60 deg.

PERFORATED METALS

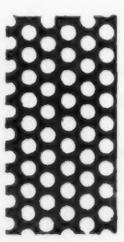
Every Sheet Metal Worker needs perforated metal in one form or another.

For processing food products and to withstand certain chemicals, perforated Stainless Steel and Monel Metal are much used.

Factory Safety Guards—For this service perforated metal has no equal.

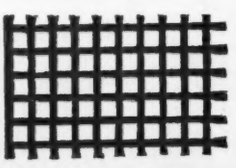
For Grilles, Radiator Enclosures, Air Conditioning Cabinets, we have many beautiful designs.

Write today for information and prices.



You'll like H&K prompt, satisfying work and pleasing prices.

Perforators of metals since 1883. Send us your specifications.



The Harrington & King PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

Commercial Ventilation With Housed Fans

(*Continued from page 57*)

of the diameter. Follow these suggestions and you can forget failures.

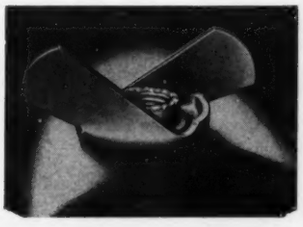
Another frequent error arises in attempting to utilize obsolete chimneys as flues for exhausting air. Of course, if the chimney is large enough this can be done, but usually the areas are but a small fraction of the required size. Bricks and rough mortar cause an additional resistance to air flow and this method is definitely not recommended.

Restaurants Are "Hot" Prospects

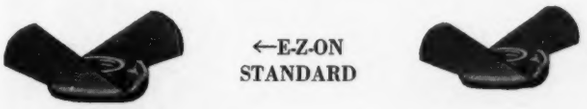
We have several dozen successful restaurant ventilating jobs to our credt. In each case where it was the kitchen that was involved we went right to the source of the heat, i.e., the stove, built a big hood over the stove and ran a large size duct from the hood immediately through the roof.

Wherever possible we constructed the hood approximately 12 inches longer and wider than the top measurements of the stove itself. Smoke and fumes do not rise straight up, but are characterized by spreading and drifting. When the hood is of ample proportions it will catch these smoke

ANOTHER *FIRST* FOR *E-Z-ON!*



Standard equipment on all E-Z-ON Damper Regulators now includes the new, revolutionary style wing nut. Designed to fit the fingers and allow more leverage for hand tightening, it is the only wing nut that can be tightened with a wrench for final set. Better damper assembly jobs demand that you use the new improved E-Z-ON.



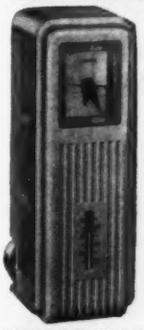
←E-Z-ON STANDARD

E-Z-ON→ SNAP-TITE

Your Jobber Stocks Them

M. A. GERETT CORPORATION
Milwaukee, Wisconsin

THERMOSTATS *by Sampsel*



DAY-NIGHT CLOCK

THEY'RE *Shock* PROOF

STANDARD

PROTECTOLITE

Whatever Your Control Problem, Sampsel Can Serve You— Write Us!

FIRE PILOT CONTROL

The line includes five types—in sizes to control stokers in the smallest domestic—up to the largest commercial installation. Each unit is easily installed; requires minimum service. Incorporates built in entrance switch —1, 2 or 4 timings per hour. Underwriters' approved.

WARM AIR FURNACE CONTROL

A three-in-one control with wiring combinations that adapt it to 2 or 3 wire, line or low voltage limit control operation or 2 wire line voltage fan control operation.

DAMPER MOTOR CONTROL

For all types of hand fired domestic heating plants. Operates on temperature change of ¾°. Equipped either with Sampsel Day-Night Clock, or standard thermostat.

ATTIC FAN CONTROL

Operates attic fan automatically at any desired time for any desired period. Equipped with thermostat, it will operate fan automatically on temperature rise and fall.

WRITE FOR LITERATURE AND PRICES

SAMPSEL TIME CONTROL, INC.
SPRING VALLEY . ILLINOIS

and steam clouds. Six feet three inches is a convenient height for the measurement from the floor to the bottom of the hood.

Whether the hoods are made to curve from front to back, or from front and back to the middle, or to curve from all sides to the middle does not seem to make a lot of difference, provided the fan and duct are of ample size. As a matter of fact the sides can be straight and even the top flat.

Measurements from bottom edge of hood to top on small hoods should be from 12 to 18 inches. On large hoods they should be from 24 to 30 inches.

There are those who vigorously champion direct motor connected fans with the argument that belt driven fans lose efficiency by slippage. We have installed belt driven fans in situations where they were regularly subjected to an excessive amount of grease and we have yet to notice any lost motion. These installations are not a matter of a few months, but rather years of continuous operation.

Where grease would be particularly bad we simply extend the length of the fan shaft and place the motor and pulleys outside the duct or housing. Some typical housed fans are shown in Fig. 4.

If you are quality-minded—here's how to get extra quality at no extra cost. Buy Ruberoid Asbestos Paper. It has ⅓ more wet strength than the average asbestos paper. You can give your customers extra values.

Ruberoid Asbestos Paper has everything! Wet strength, accurate caliper, color and finish. The color—a soft natural blue-white. The finish—smooth on one side; rough textured for adhesion on the other side.

We urge you to try Ruberoid Asbestos Paper for wrapping furnace pipes—protecting air conditioning ducts, wood partitions, lining stoves, ovens and gas ranges. Mail coupon for free 5-foot sample. Compare its wet strength, flexibility, color, finish and ease of application.

FOR WARM AIR DUCTS, CORRUGATED ASBESTOS PAPER
Sturdy because of design of corrugation. Provides needed strength to keep air cells from crushing. Flexible, fire-resistant, easy to handle, efficient.

RU-BER-OID
ASBESTOS PAPERS

AA-8

The RUBEROID Co., *Insulation Division*
500 Fifth Avenue, New York City

Send us your free 5-foot test sample of Ruberoid Asbestos Paper. We understand this places us under no obligation.

*Name*_____

*Address*_____

*City*_____ *State*_____

Since Ruberoid sells through wholesale trade only, please give jobber's name.

FREE THIS CANISTER CONTAINING *5 foot Sample*

"HAVE CLARAGE MAKE THEM"

Every year we ship to furnace manufacturers and to builders of unit air conditioners thousands upon thousands of Clarage Blower Wheels and Assemblies. These smaller units were designed with the same skill characteristic of the larger Clarage equipment—just as carefully constructed—just as carefully tested. And we have sizes to meet ALL REQUIREMENTS—with slow speed operation insuring SILENT PERFORMANCE. May we have your next inquiry?

SPECIFY CLARAGE for
COMPLETE AIR CONDITIONING
VENTILATION
HEATING
COOLING
MECHANICAL DRAFT
FANS & BLOWERS FOR INDUSTRIAL NEEDS

CLARAGE FAN COMPANY • Kalamazoo, Mich.
SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

Kruckman—Defense Area Rulings

(*Continued from page* 52)

pariso, Jacksonville, Key West, Pensacola, Tampa. **Georgia:** Albany, Columbus, Macon, Savannah, Atlanta. **Illinois:** Alton-East Alton, Chicago, Joliet, Rockford, Moline, Waukegan, Rantoul. **Indiana:** Connersville, Evansville, Anderson, Fort Wayne, Indianapolis, Kingsbury-LaPorte, Lafayette, South Bend. **Iowa:** Des Moines, Burlington, Council Bluffs, Davenport. **Kentucky:** Henderson, Louisville. **Louisiana:** Lake Charles, Alexandria, Leesville-DeRidder, New Orleans. **Massachusetts:** Lynn, Boston, Quincy, Greenfield, Springfield-Chicopee, Worcester. **Maine:** Bangor, Bath-Brunswick, Kittery, Portland. **Maryland:** Aberdeen, Annapolis, Baltimore, Elkton, Hagerstown, Laurel. **Michigan:** Battle Creek, Bay City, Detroit, Midland, Muskegon, Pontiac, Saginaw, Ypsilanti, Lansing. **Mississippi:** Columbus, Biloxi, Meridian, Jackson. **Kansas:** Junction City, Kansas City, Wichita. **Missouri:** Kansas City, Lebanon, Rolla. **Nevada:** Las Vegas. **New Hampshire:** Manchester, Portsmouth-Kittery. **New Jersey:** Camden, Metropolitan District of New York in New Jersey, Phillipsburg, Trenton. **New York:** Albany, Bethpage-Farmingdale, Buffalo-Niagara Falls, Elmira, Greenport, Long Island, Ilion, Massena, Rome, Schenectady, Sidney, Staten Island, Syracuse, Utica, Watertown. **North Carolina:** Fayetteville, Jacksonville, New Bern, Moorhead City, Wilmington. **Nebraska:** Omaha. **Ohio:** Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Hamilton, Lorain-Elyria, Mansfield, Middletown, Sandusky, Steubenville, Warren, Youngstown, Toledo. **Oklahoma:** Lawton, Tulsa, Oklahoma City. **Oregon:** Astoria, Pendleton, Portland-Vancouver. **Pennsylvania:** (Eastern District)—Allentown-Bethlehem, Harrisburg, Philadelphia-Chester, Williamsport; (Western District)—Beaver Falls, Elwood

GENERAL CONTROLS *ANNOUNCES*
A MANUAL RESET SWITCH TYPE
THERMOPILOT

Provides Complete, Safe Control in Case of Pilot-Flame Failure for Domestic and Industrial Gas Applications

The A-100-5 Thermopilot operates on the proved thermocouple principle. The flame being applied to the thermocouple element maintains electrical contact when manually set, closing the circuit to the main gas valve. When the pilot gas flame fails, the Thermopilot opens the circuit, causing the gas valve to close. The A-100-5, being of the manual reset type must be manually reset after pilot flame is relighted or restored. When the button is pressed, armature and core are engaged and contacts will not be made until safe condition at pilot exists and release of button engages contacts. No adjustments need be made for installations; all parts are sealed. Contact ratings: 10 amps. at 115V.

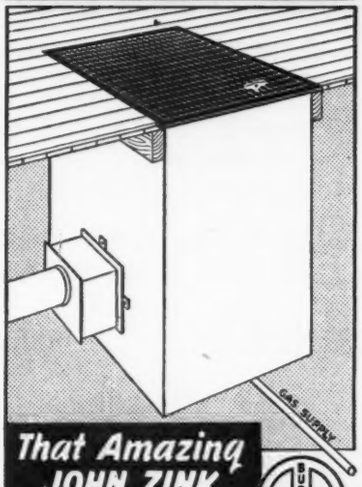
ASK FOR LITERATURE

GENERAL CONTROLS
801 ALLEN AVENUE • GLENDALE, CALIFORNIA
Branch Offices: Boston • New York • Philadelphia
Atlanta • Cleveland • Detroit • Chicago • Kansas City
Houston • Dallas • San Francisco

JOHN ZINK

One of the largest manufacturers of Gas and Oil Burners in the world manufactures a - - - - - - - - -

FLOOR FURNACE



That Amazing **JOHN ZINK FLOOR FURNACE**

As you would expect this Furnace features a larger, improved combustion chamber and a One-port Non-plugging Gas Burner.

•

John Zink Low Pressure Burners

for

DOMESTIC FURNACES
HEATING BOILERS POWER BOILERS
GASOLINE PLANT BOILERS

•

Aggressive Dealers Write for Details

•

John Zink Company

4401 S. Peoria Ave. Tulsa, Okla.
342 Madison Ave. New York City

Do YOU get these Complaints

resulting from inefficient blower control in Forced Air Heating Installations?

—Blower starting noise?

—chilly blasts when the blower starts?

—"cold 70" and cold drafts due to infrequent operation of blower?

—hot blasts after blower is on full speed for a while?

You can REMEDY those complaints

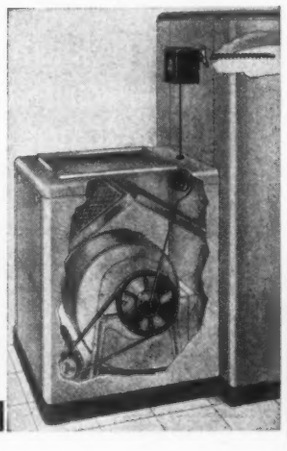
on old jobs . . . and avoid them on new jobs . . . assure more uniform heating COMFORT and greater customer satisfaction . . . by installing the

MASTER BLOWERTROL
Thermostatic **HYDRAULIC CONTROL**

This simple, inexpensive, tested-and-proved control increases and decreases blower speed GRADUALLY in ratio to the bonnet temperature of heating unit.

It assures more complete COMFORT, economy and satisfaction from any Forced Air Heating System using a centrifugal blower.

It is automatic in operation, carefully constructed, — dependable! Adaptable to old or new installations, regardless of fuel used.



WRITE for BULLETIN

giving full details of construction and operation.

WHITE
MANUFACTURING CO.
2360 University Ave.
St. Paul, Minnesota

City, Johnstown, Monessen, Rochester, Ambridge all in Beaver County, Erie, Pittsburgh. **Rhode Island:** Newport, Quonset Point-Warwick. **South Carolina:** Charleston, Columbia, Spartanburg. **Tennessee:** Nashville, Knoxville-Alcoa. **Texas:** Freeport, Vernon, Victoria, Beaumont, Port Arthur, Brady, Corpus Christi, Dallas-Grand Prairie, El Paso, Fort Worth, Galveston, Goose Creek-Baytown-Pelly, Harlingen, Houston, Mineral Wells, San Antonio, Wichita Falls. **Utah:** Ogden. **Vermont:** Springfield-Chester. **Virginia:** Alexandria, Newport News, Norfolk-Portsmouth. **Washington:** Bremerton, Longview-Kelsox, Seattle, Spokane, Tacoma, Vancouver. **West Virginia:** Charleston, Morgantown, Weirton. **Wisconsin:** Beloit, Green Bay, Manitowoc, Two Rivers, Madison, Milwaukee, Oshkosh, Racine-Kenosha.

◆

Air Conditioning For Builders

(*Continued from page* 61)

screen under cold air grills, it will hold lint and dust and retards circulation. Always remember that the sizes given for gravity heat pipes are for a maximum of 12 feet in length. Pipes longer than 12 feet take the next larger commercial size.

◆

FHA Fall Program For Rehabilitation

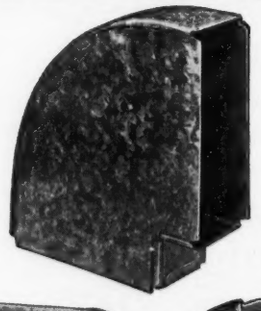
(*Continued from page* 47)

Revised folder for dealers and general public. The FHA publication, "Improvements Eligible for Financing with FHA-Insured Loans" (Form FHA 145), has

AJAX

PREFABRICATED DUCTS—FITTINGS
***for* Forced Air and Air Conditioning Installations**

24-hour Delivery Service



Our Engineers Are At Your Service

Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

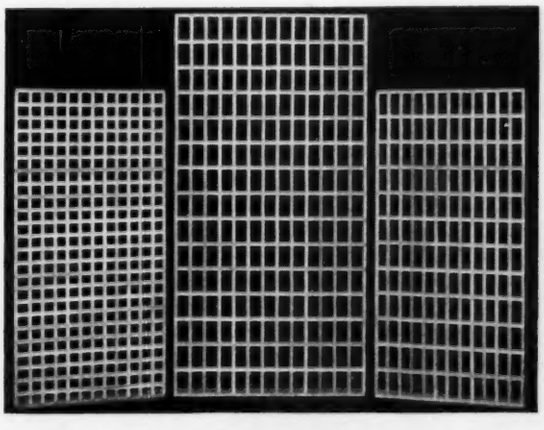
THE CINCINNATI SHEET METAL & ROOFING CO.
Furnace Fitting Department
230 E. Front St. Cincinnati, Ohio

been revised and re-issued with the new Title I terms. This folder is designed primarily for dealers but may be used also for distribution to the general public. It answers specific questions as to what type of improvements may be made, terms available, etc. Manufacturers, dealers, and lending institutions may obtain a limited quantity of the revised publication for general distribution.

Motion Picture—"We Americans," a Technicolor short starring Frank Craven, is an entertaining movie containing an explanation of how to pay for repairs on the FHA Plan. This film is available for regular showing in theatres, and local exhibitors should be consulted for dates of showing. Newspaper ad suggestions, designed for dealer "tie in" to the film, are available through local newspapers.

Radio dialogues. The FHA will supply a series of twelve 5-minute dramatic radio dialogues that may be sponsored by local advertisers interested in selling home repairs. These dialogues are available as electrical transcriptions, and arrangements for their use should be made with local radio station. Many radio stations are cooperating in this program with Commercial and sustaining spot announcements and talks by FHA officials.

This 1941 program, in which thousands of business concerns are expected to cooperate, will continue through the fall season. Many items of tie-in material are available through local media such as newspapers, radio stations, motion picture exhibitors, transportation advertisers, etc. Requests for booklets, window display material, dealer helps, etc., should be addressed to the Division of Education, Federal Housing Administration, Washington, D. C.



MARSH WOOD FACES

A modern, harmonizing grille or register installation can do much to increase the attractiveness of any home or office. You can be sure of a tasteful, efficient heating, air conditioning or ventilating installation by using Marsh Wood Faces whenever possible.

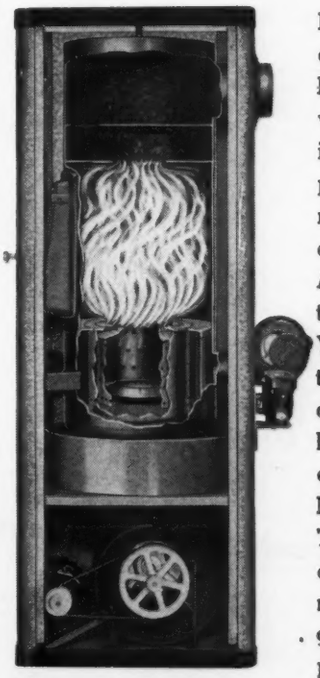
They're durable, reasonable in price and surprisingly attractive. Made of the finest, selected kiln-dried oak and machined on special machinery designed for the specific purpose of making wood faces, you'll be surprised how fast your customers will take to them. Write us today for more information.

MARSH LUMBER CO., INC.
DOVER OHIO

Attention . . .

DEALERS WHO HAVE NOT ORDERED SAMPLES of the

MONOGRAM FURNACE



If you haven't as yet ordered your sample Monogram Furnace . . . we suggest you send for it RIGHT NOW! This superior heating line has met with wide acceptance among dealers AND homeowners, and there's no reason why YOU shouldn't cash in too. MONOGRAM is a dependable, fast-selling line because of the revolutionary Turbulent Flame "Vaporizing" Type Burner. When we entered the oil heater market, we felt that the gravity and so-called pot-type burners could be improved on—hence brought out the MONOGRAM. This sensational burner has proven its superiority through actual laboratory tests operating with the highest known efficiency of over 80% as rated in accordance with the standards of the Institute of Cooking and Heating Appliance Manufacturers. Subsequent dealers' reports of superlative performance and consequent buyer satisfaction and recommendation proved the MONOGRAM to be the line they had wanted for some time.

We suggest you order your sample furnace now . . . compare the performance with others you have previously sold, and you'll be a MONOGRAM dealer from then on. Write us today for further information about the MONOGRAM Furnace line.

The Quincy Stove Mfg. Company
Quincy - - - - - - - - Illinois

★ ★ ★ ★ ★

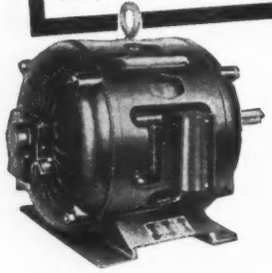
Is your equipment being used in DEFENSE INDUSTRIES, ARMY CANTONMENTS, NAVAL STATIONS, SHIPS?... If so, you need Dependable

WAGNER MOTORS

Our country has sounded the call for equipment and machinery for national defense. Equipment manufacturers everywhere are answering that call—refrigeration equipment manufacturers are no exception. Already thousands of refrigerating units are doing their part in the defense program—a large percentage of these units are powered by Wagner motors, and for good reasons, too. The name Wagner means

1. An established reputation for building efficient, dependable motors.
2. A complete line—the right motor for every type of equipment, and all service conditions.
3. Quick shipments to handle rush defense orders.
4. Large plant capacity to handle any order, large or small.
5. Fifty years of manufacturing experience.
6. Convenient service facilities through 25 branches.

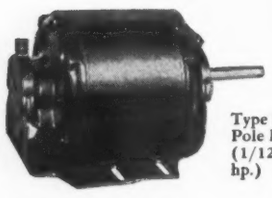
Six good reasons why you should look to Wagner for motors for all your defense production. Wagner Electric Corporation, 6400 Plymouth Avenue, Saint Louis, Mo., U. S. A.



Type RP, Squirrel-Cage polyphase motors. (1/6 to 400 hp.)

Type RA, Repulsion-Start-Induction single-phase motors. (1/8 to 15 hp.)

Type RK, Capacitor-Start Induction-Run motors. (1/8 to 3/4 hp.)



Type M, Shaded-Pole Fan motors. (1/125 to 1/30 hp.)

M41-22A

WAGNER ELECTRIC CORPORATION 50TH 1891 • 1941 ANNIVERSARY ST. LOUIS, MO.

SEND FOR YOUR FREE COPIES OF BULLETINS MU-177 AND MU-182

Wagner Electric

This year Wagner celebrates its fiftieth year of service to industry and the home—as a manufacturer of motors, transformers, and fans of the highest quality.

The Problem Corner

Soldering Chromium Plated Metal

American Artisan:

Will you please tell us what flux to use in soldering chromium plated metal?

K. S., Kansas.

Reply by

The Editors

American Nickeloid Company, a manufacturer of chromium plated sheets advises that there is no way of satisfactorily soldering chromium plated material, because the chromium plating is too hard to "take" solder. They suggest that you can solder the base metal if you will remove the chromium plating with muriatic acid. If possible, in assembly seams to be soldered should be placed on the back side of the work where the removal of the chromium plating will not show and will not matter. For soldering base metal under chromium plating, this manufacturer suggests a paste flux which does not spatter.

◆

Return Grille Location

American Artisan:

Will you please advise us if any manufacturer is advocating locating return air grilles in the wall just above the baseboard? This is on forced warm air systems. If such an idea is advanced will you please explain the theory of such location. If such an idea is not advanced what do you think

BOY, OH BOY! THIS JOINT WAS REALLY SEALED...LOOK AT THE WAY THAT FURNACE CEMENT LAYS ON THERE!
YES-SIR-EE! ...AND I'LL BET TEN TO ONE IT'S THARCO!

YOU DON'T have to worry when you seal a joint with THARCO ASBESTOS FURNACE CEMENT. Apply THARCO according to directions and you'll find it "in there pitching" when many other cements would have long been "sent to the showers." THARCO will not *SHRINK;* IS ODORLESS, FIRE AND ACID PROOF. INDESTRUCTIBLE. Try it on your next job.

THE ARMSTRONG COMPANY

DETROIT DALLAS CHICAGO

of the idea? We have been refusing work where this location is specified, but one contractor is using the idea with single speed, intermittent operating fans.

G. E. J., Wisconsin.

Reply by
The Editors

We have looked through all the manufacturers manuals we have on hand and find no specific recommendations as to whether return air grilles should or should not be just above the baseboard.

We quote from the findings of the University of Illinois, Research Residence:

"Tests in the Research Residence confirm preceding statements that the location of cold air return grilles do not appreciably affect the room air temperature conditions. The suction effect of a return grille is extremely localized and does not extend very far into the room. A general drift of cool air at a very low air velocity toward a return grille is observable, but such slow drifts are not sufficient to produce marked changes in the air temperature in the room. It is common practice and probably a desirable one, to install cold air grilles near outside wall and under windows. It should be realized that the most effective method of directing the air circulation in the room is by adjusting the air flow from the warm air registers.

"In general, cold air grilles should be located at the baseboard, near the floor level, although construction conditions may require that grilles be placed two or three inches above the floor. Although floor grilles are effective and cheaper to install, they serve as dirt traps and hence are not desirable.

You will see from the above that whether the return is in the baseboard or just above seemingly does not make much difference.

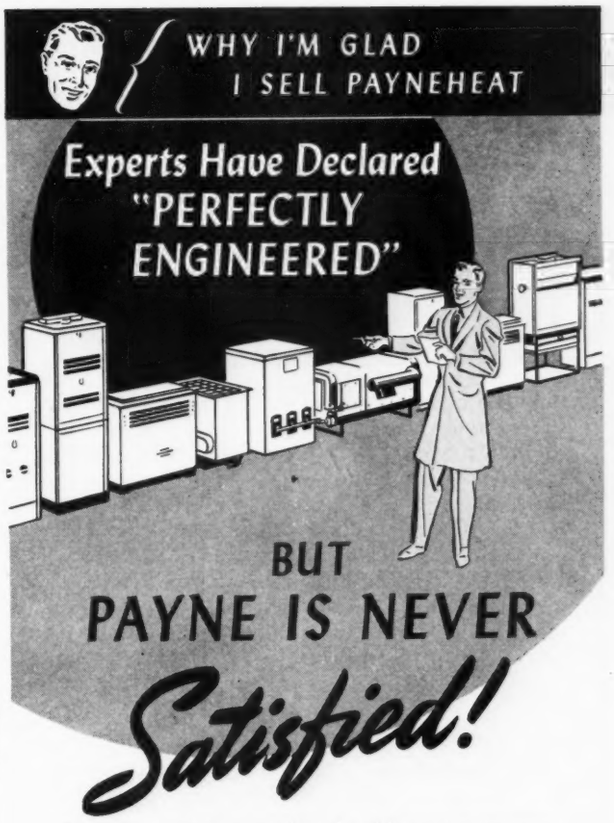
Should you wish additional information, we suggest that you address a letter to Prof. S. Konzo, 1108 W. Stoughton St., Urbana, Illinois.

FLANGED and DISHED
FURNACE HEADS

Commercial flanged and dished heads have been furnished to the industry for years. These heads are die formed, have smooth flanges, and uniform diameters, thus a close smooth fit against the body of the furnace is obtained, which prevents escape of gas.

Commercial heads are made in standard outside diameters of 22″—24″—26″—28″ with straight flanges, having no outward flare, weld or riveting flange.

THE COMMERCIAL SHEARING & STAMPING CO.
YOUNGSTOWN, OHIO



"No such thing as 'perfect'," insist PAYNE Gas Heating Technicians as they invest thousands of man-hours each year . . . testing, proving, *im*proving. ★ That's why the PAYNE Dealer can make promises for PAYNEHEAT that he knows will be kept — and why Gas Companies build loads steadily on the performance of PAYNE equipment. ★ The Nation's largest exclusive manufacturer of gas heating equipment, PAYNE offers 69 styles and sizes of units. You can stake your reputation on the performance of all of them!

PAYNE
FLOOR FURNACE

Also: Gravity Unit, Duplex Furnace, Modern Console, Sentry Forced Air Unit, Zoneair Unit, Spacesaver Unit, Industrial Units and Accessories.

A few territories are open for representation. Address J. H. Keber, Sales Manager. Please mention this advertisement.

PAYNEHEAT
MORE THAN A QUARTER-CENTURY OF GAS SPECIALIZATION
Payne Furnace & Supply Co., Inc., Beverly Hills, California

Don't Lose PROFITS in Replacing DEFECTIVE CHIMNEYS . . .

***use* HEREMETAL**

Corrosion and condensation troubles are always the source of much annoyance and expense to the homeowner. Besides tending to shorten the life of the chimney, they can also help run up fuel bills by contributing to poor furnace efficiency. Complaints like these can be quickly and economically eliminated through use of HEREMETAL Chimney Liners. Weather-proof, moisture-proof, acid-proof and corrosion-resistant, they are easy to install, consequently offer you a chance for extra profits in your dealings with homeowners.

We suggest you get the start on your competition NOW! Be ready with a complete heating and repair service this Fall. Write for more information on HEREMETAL Chimney Liners today!

The Heremetal Company

135 Aldrich Ave. N. - BR. 8611 - Minneapolis, Minn.

QUALITY EQUIPMENT-- FROM HESS-- COSTS LESS

DEALERS---Write for our New 1941 Portfolio

By selling — repairing, modernizing or replacements, needed by owners of a majority of heating plants now in use.

HESS BLOWER FILTER UNITS
HESS WELDED STEEL FURNACES
HESS AUTOMATIC OIL BURNERS
HESS AUTOMATIC COAL STOKERS

ARE GREATEST VALUES
AT LOWEST PRICES

The Hess line is complete for every dealer requirement, distinctively different and more saleable. Financing plan and territory plan—helps Hess dealers.

WRITE FOR DEALER PORTFOLIO

HESS WARMING & VENTILATING CO.
1211-27 S. WESTERN AVE. Founded 1873
CHICAGO, ILLINOIS

F. H. A. Reports For First 6 Months of 1941

MORE than 100,000 new small homes have been started under the Federal Housing Administration's mortgage insurance plan since January 1. Construction is beginning every working day on approximately 1,000 homes.

Recent surveys show that about 70 per cent of all homes now being built under the FHA are in the 193 defense areas so far designated specifically by the President as having present or impending acute housing shortages. A substantial proportion of the remainder are in areas not legally so designated but nevertheless important to the defense program in an industrial or an agricultural capacity. Thus, as much as 85 or 90 per cent of all FHA-insured houses are related to defense needs.

Repair Loans at Record Volume

Title I loans for repair and alteration of homes and commercial properties also proceeded in record volume during the first 6 months of the year, exceeding $300,000,000. It is estimated that approximately 50 per cent of this volume involves properties located in or close to the 193 designated areas.

Since FHA mortgage insurance applications are customarily an accurate barometer of housing activity throughout the country, these figures indicate private residential building for the coming few months will maintain its rapid pace.

Allocations were made for more than 10,000 homes during the week ended July 5, C. F. Palmer, Defense Housing Coordinator, has announced.

These homes for defense workers and their families will be in 34 localities of 21 States, and the District of Columbia.

Also more than 1,400 homes were completed during the week. This raises the total number of completions, as of July 5, to 18,947 homes in 65 localities of 29 States and territories.

◆

Materials For Small Users To Come from Autos, Refrigerators, Washers

A TENTATIVE program for curtailment of production in three leading consumers durable goods industries was announced July 20 by Leon Henderson, administrator of the Office of Price Administration and Civilian Supply.

The program covers the automotive, domestic mechanical refrigerator, and mechanical household laundry equipment industries. It is designed to reduce consumption of scarce materials in these industries during the next 12 months by 50 per cent.

The program is being undertaken with full realization of the possible dislocating effect of such a reduction on employment and operation of the economy generally, but it is necessitated, declares OPACS, by severe shortages of steel, nickel, copper, rubber, and other basic materials for these and other civilian durable goods industries. It is anticipated that the reduction will be partially offset by the increasing participation by these industries in defense work, the automobile industries having already undertaken contracts for $2,000,000 worth of defense goods.

Complaints reaching OPACS from all over the coun-

A New SAL-MO Product!
SAL-MO ASBESTOS DUCT BOARD

Developed especially for use in constructing cold air return duct. Conserves the use of metal.

Sal-Mo Asbestos DUCT BOARD is a fire and moisture proof product . . . . light in weight . . . . easily applied . . . . durable.

Made in sheets 33″ x 48″, 1/8″ thick, just the right size to cover three joists spaced at 16″ centers, making two cold air return ducts.

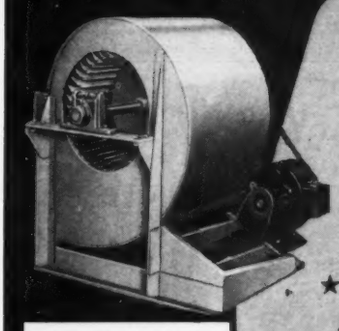
Samples and further information gladly furnished on request.

SEE YOUR NEAREST JOBBER

SALL MOUNTAIN COMPANY
176 West Adams Street Chicago, Illinois

QUALITY-BUILT QUIET-AIR BLOWERS

COMPETITIVELY PRICED . . . SOLD DIRECT
TO MAKE YOU MONEY



★ Delivers more air per revolution than any other blower of its size.
★ Patented motor mount automatically maintains proper belt tension.
★ Extra heavy construction for long life. No chatter. No vibration.
★ Exclusive fan design for greater capacity. QUIETER, almost noiseless.

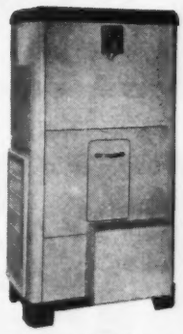
PATENTED BEARINGS *GUARANTEED* FOR FIVE YEARS

Self-aligning — self-lubricating. Require no attention. No rubber to deteriorate.

Here's the blower you've been hoping for! Quality-built, yet competitively priced and sold direct from factory to you. *Gives you extra profit.* Get the facts on QUIET-AIR—full proof that it's a new profit opportunity for you!

MAPLE CITY STAMPING CO.
PEORIA, ILLINOIS

The VIKING FURNACE Line puts you in Line for More NEW HOME Business!



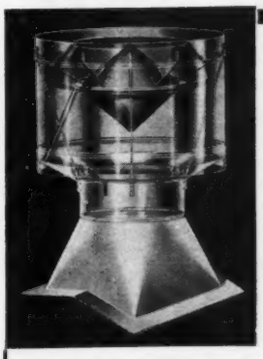
Models for basement or utility room

No other line can offer you the sales opportunity that is yours with Viking Oil-Burning furnaces. A *complete* line of specially designed models for the smaller capacity field—from 55,000 to 100,000 BTU. That means 9 out of 10 new homes being built today! A quality-built line—packed full of real sales features—remarkably low priced—proved by thousands of installations for large housing projects.

Write today for free Viking furnace catalog — also catalog of oil-burning water heater line, capacities from 20 to 45 gallons.

VIKING MFG. CORPORATION
Box 43, Strathmoor Station, Detroit, Michigan

VIKING OIL BURNING
FURNACES
WATER HEATERS
SPACE HEATERS



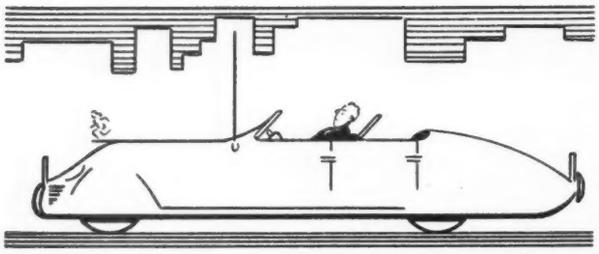
BURT
IS GEARED TO MEET SPECIAL NEEDS IN
ROOF VENTILATORS

Free Flow Gravity

The Burt line is so varied and complete that filling any particular specification presents no problem to Burt Engineers or the Burt plant. Gravity, fan and Monovent continuous ridge ventilators come in a wide range of sizes and are readily adapted to meet the needs of practically any situation,—all scientifically engineered to produce top efficiency, built to give long dependable service, and priced so you can get the job.

THE BURT MFG. CO.
ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS
301 Main St., Akron, Ohio

SEND FOR CATALOGS
Burt Engineers are glad to help on plans



"I Knew That Guy When He Didn't Sell Anything But Heating"

Heating alone is not enough today. It's the dealer with the *complete line* who rakes in the dough. PREMIER dealers know that. They're doing a profitable year 'round business, because they have the most complete line on the market — backed by a great program of factory help in selling, engineering, etc. Find out about the exclusive PREMIER franchise. Write today!

PREMIER FURNACE CO.
Dowagiac, Michigan

Write

for This Portfolio

PREMIER

- Warm Air Heating
- Air Conditioning
- Automatic Fuel Burning
- Cooling Equipment

The Year Round Line

WHITNEY LEVER PUNCHES

No. 4B PUNCH

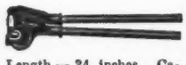
Length 8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—⅛" to ⅜" by 64ths.

No. 91 PUNCH

CAPACITY

½-inch hole through ¼-inch iron; ¾-inch hole through ⅜-inch iron; 2-inch hole through ¼-inch iron. Depth throat, 5 inches. Weight, 82 lbs.

No. 1 PUNCH



Length — 34 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes from ⅛ to ⅜ by 64ths.

No. 2 PUNCH

Length — 23 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes ⅜-inch to ½-inch by 64ths.

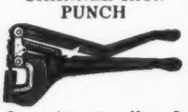
No. 6 PUNCH

Length—26½ inches. Capacity — ¼-inch hole through ⅜-inch iron; especially adapted for button punching or templet work. Punches and dies ⅛" to ⅜" by 32nds.

We have tools for every purpose needed by Sheet Metal Contractors.

Ask your Jobber.

CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two Punches Interchangeable, including punches and dies. Capacity—¼-inch hole through ¼-inch iron.

W.A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

try indicate that material shortages have been affecting different industries and companies disproportionately. It is becoming evident that unless prompt action of this type is taken, increasing needs of the defense program for raw materials will force complete shutdowns of many producers of civilian goods—wholly without regard to the relative need for their products. The proposed program provides for an orderly curtailment in those industries where reductions will do the least harm and is expected to relieve the heavy pressure on mills and factories for immediate and near immediate deliveries for all kinds of civilian and defense materials. It is also expected to allow for orderly distribution of consumers goods since it is known that distributors have substantial inventories of most of these items.

These three industries are either the largest or close to the largest civilian consumers of the common metals where shortages now exist. The program is designed to save for other civilian uses which cannot be postponed approximately 4,250,000 tones of iron and steel as well as substantial amounts of other scarce materials such as nickel, copper, tin, zinc, aluminum, chromium and lead.

The tentative program for automobiles and light trucks calls for an output of approximately 200,000 per month throughout the next 12 months. Production of household mechanical refrigerators will be limited to a monthly maximum of approximately 150,000 units. Production of domestic mechanical washing and ironing machines will be reduced initially by 30 per cent under the average for the past 12 months. This will be followed by more stringent cuts.

"NEW FIELDS for Profits in NEW METALS"

- CHROME FINISHED COPPER
- CHROME FINISHED STEEL

Write us regarding your problems of designing and trim on interior and exterior finishes.

APOLLO METAL WORKS
6653 S. Oak Park Chicago, Ill.

Repair Parts FOR ALL HEATING UNITS

BRAUER REPAIR PARTS STOVE FURNACE BOILER OIL STOVE RANGE

A. G. BRAUER SUPPLY CO.
Distributors of All Heating and Air Conditioning Equipment
2100 Washington Ave. St. Louis, Mo.

50 YEARS OF LEADERSHIP
The Time-Tested
ATH-A-NOR

Furnaces, like any other piece of merchandise, are only as good as the people who make them. The May-Fiebeger Company has been making the ATH-A-NOR Furnace illustrated for over fifty years, and the fact that it will perform with unusual efficiency and economy is backed up by hundreds of satisfactory installations.

If you've been looking for a fast-moving, top performing gravity furnace to round out your line, investigate the ATH-A-NOR now! A postcard request will bring literature.

- QUALITY
- ECONOMY
- EFFICIENCY

. . . write today for further information!

MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS

MAY-FIEBEGER COMPANY
NEWARK OHIO

WHEN YOU BUILD TO LAST USE MAZEMADE

SOLID COPPER NAILS

Most permanent of all nails—solid copper nails are manufactured by W. H. Maze Company in special designs for asbestos, and slate roofing, cornice and valley sheet metal work. Now conveniently packaged in 5-lb. cartons. By the manufacturers of Maze Zinclad Nails—since 1854.

FEATURING
The "SCREW THREAD" for greater holding power

Imbeds in the wood as the nail is driven. Cannot work out!

FIVE STYLES
All Sizes for
ASBESTOS
SLATE
CORNICE
VALLEYS

A better design for every purpose. Full range of sizes. WRITE FOR SAMPLE CARD!

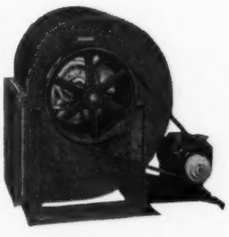
NOW PACKAGED IN HANDY 5 lb. CARTONS

W. H. MAZE COMPANY
PERU, ILLINOIS

YOUR BLOWER REQUIREMENTS

available at

Schwitzer-Cummins Company



- **BLOWERS FOR EVERY PURPOSE**
  HY-DUTY Blowers, 9 ¾" to 25".
  Top and Bottom Horizontal, and Top and Bottom Vertical Discharge.
  Top and Bottom Motor Mounting.
  Dual Units also available.

- **CENTER DISC WHEEL**
  Double Inlet, Double Width.
  Reinforced Center Disc.
  Designed for Modern Air Conditioning and Heating Applications.
  Sizes, 4 ½" to 50".

- **SINGLE INLET WHEELS**
  For Oil Burner, Stoker, and Air Conditioning Applications.
  Sizes, 4 ½" to 50".
  Variety of Blade Lengths for each diameter.

- **ENGINEERING DATA**
  Write for Catalogues showing complete Performance Data.
  Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
125 FAN STREET INDIANAPOLIS, U. S. A.

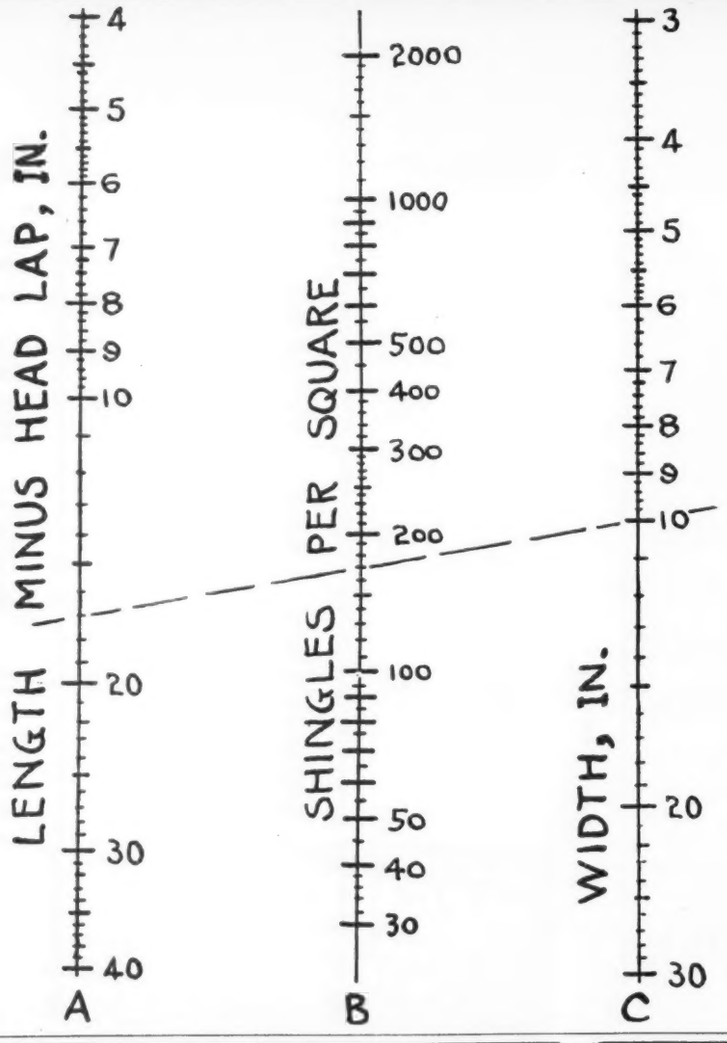
DRIES FASTER
SETS STRONGER
LASTS LONGER

From every angle outstanding advantages are apparent in **LACLEDE FURNACE CEMENT.** For a tighter joint and one that **stays** tight—insist on Laclede brand, Generous FREE sample on request.

FOR EVERY COMBUSTION CHAMBER

—Oil, coal or gas fired—there is a Laclede high temperature specialty that will do it better. Write for full information.

LACLEDE-CHRISTY CLAY PRODUCTS CO.
ESTABLISHED SINCE 1844
411 N. SEVENTH ST. • ST. LOUIS, MO.



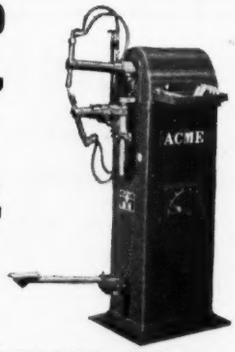
Nomograph charts for quick solutions of problems are always popular. Here is a chart which gives the number of shingles per square required for any length, width or head lap. The chart can be used for any type of pieced covering.

By
W. F. Schaphorst, M. E.

BE PROFESSIONAL
Use the
GRAND RAPIDS FURNACE CLEANER
Free Trial
Convenient Terms

Write for details
DOYLE VACUUM CLEANER CO.
227 STEVENS ST., S. W. GRAND RAPIDS, MICH.

SPOT WELD
WITH AN
ACME "Hot Spot" WELDER
Proven utility for over 26 years in thousands of sheet metal fabricating plants.
Write for Literature and Prices.
Complete Range of Sizes
Lifetime Guarantee!



ACME ELECTRIC WELDER CO.
2618B Fruitland Road Los Angeles, Calif.

Bremil

PORTABLE SHEARS
Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line. Prompt shipment can be made from stock.
ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be obtained for shearing stainless steel.
BREMIL MFG. CO., ERIE, PA.

BB
HOOKS AND HANGERS

THRU
LEADING
JOBBERS
EVERYWHERE

BERGER BROTHERS CO.
Main Office & Factory
229-237 Arch St.
Philadelphia, Pa.
Branch
16th & Grove Sts.
Jersey City, N. J.

How Many Sheet Metal Shingles?

CONTRACTORS laying sheet metal shingles are often asked, "How many shingles will be needed for this roof?"

This question which arises so frequently can be answered readily without doing any pencil figuring whatever. Simply use the accompanying chart.

The only figuring that is necessary can be done in one's head, namely: subtract the head lap in inches from the length of the shingle. Thus, if the length of the shingle is 20 inches and if the head lap is 3 inches subtract 3 from 20 and you have 17. Find the 17 in column A and run a straight line from that point to the width of the shingle in column C, and the number of shingles required per square is immediately found in column B.

The dotted line drawn across this chart shows that if the length of shingle is 20 inches and the width of shingle is 10 inches, 170 shingles will be required per square.

The range of the chart is great enough to care for almost any condition. It will take care of all lengths of shingles, column A, from 4 inches to 40 inches, and all widths of shingles, column C, from 3 inches to 30 inches. And as column B indicates, any combination of these lengths and widths will give you shingles per square all the way from 30 to 2,000.

In other words, any straight line drawn across the chart from any figure in column A to any figure in column B gives the number of shingles per square in column B.

The chart can also be used for other purposes. For example, if the architect specifies the type of shingle to be used and the head lap he thinks necessary but does not specify the width of the shingle, the chart can be used to determine what width of shingle is most economical to buy.

Such an answer is found by selecting the length of shingle minus the head lap in column A and then projecting a straight line across to column C. By moving a straight edge up and down column C several possible numbers of shingles per square will be found in column B. The contractor can then determine what width of shingle will be most economical according to the number of shingles required per square of roof.

The chart will also work for any piece roofing material such as slate or tile or for any siding bought in small pieces. The contractor is warned not to use the chart for pieces larger than shown in columns A and C because reductions by halves or thirds do not work out for the correct answer.

Put RANDALL PILLOW BLOCKS quietly to work for you

Put Randalls to work on your equipment . . . they're meant for it. Built to give a lifetime of trouble-free, quiet service with only minimum attention, they're self-aligning, self-lubricating, durable and dependable. Furthermore, Randalls are low in cost. Write for free catalog today.

One-Piece Steel Housing Pillow Block

RANDALL GRAPHITE PRODUCTS CORPORATION
Dept. 811 609 W. Lake Street Chicago, Ill.

Give your industrial customers better roof ventilation, *profitably*, with Swartwout-Dexter Heat Valve

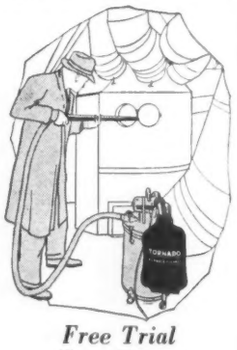
More and more large scale roof ventilating jobs are handled these days by Heat Valves — the continuous weather-proof opening that lets out hot air, smoke and fumes by natural gravity flow. *Use the original Heat Valve*—the Swartwout-Dexter—for best results.

Write for catalog and prices today.

The SWARTWOUT COMPANY, 18615 Euclid Ave., Cleveland, O.

Swartwout
VENTILATION SPECIALISTS

GET INTO THE BASEMENT
and SELL MORE
FURNACES and REPAIRS
with Breuer's Ball Bearing
TORNADO
FURNACE & BOILER
VACUUM CLEANERS
5 NEW MODELS
NEW LOW PRICES

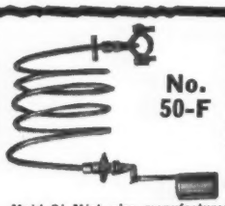


Other dealers are getting more business with the TORNADO—you can, too. Our FREE SALES PLAN tells you how. Write for it TODAY.

Free Trial
Easy Terms

BREUER ELECTRIC MFG. CO.
5082 N. Ravenswood Ave. Chicago, Illinois

WATER BOY MIDGET FEEDERS



No. 50-F

For bucket or pan type humidifiers. Is 7" long over all. Nickel plated copper float operates in water only 1" in depth. Adjustable. Valve is brass, nickel plated, with replaceable Neoprene washer. Is protected from dirt, pipe scale, etc., by a Monel metal screen. Easy to install. Comes complete with 6 ft. of ¼ inch O. D. copper tubing and a No. 8 Quick-Hook-up Saddle valve.

ALSO MANY OTHER TYPES

Maid-O'-Mist also manufactures many other types of Midget Water Feeders. The No. 51...No. 55...No. 56...No. 57...all operate perfectly under any conditions. Each has its specific purpose and the one best suited for your use is included in this extensive line. Write for full information at once.

MAID-O'-MIST HUMIDIFIERS ARE STANDARD EQUIPMENT ON MANY OF THE COUNTRY'S LEADING FURNACES

MAID-O'-MIST, INC.
213 NORTH ABERDEEN STREET CHICAGO, ILLINOIS

ALDRICH

Famous Feature

OIL BURNERS AVAILABLE NOW—NO DELAY

Aldrich anticipated—and built ahead. Right now, you can have the famous, exclusive, sales-building Aldrich features without delay. There's an Aldrich-built burner for every installation. Order now.

★ MAGIC DIAL
Regulates the adjustment of VOLUMETER while the burner is operating.

★ VOLUMETER
Controls the air volume without altering static pressure or velocity.

★ SERVICE FREE
Aldrich engineering genius practically eliminates service calls.

ALDRICH COMPANY • WYOMING ILLINOIS

The All Purpose....
AIR VELOCITY METER
INSTANTANEOUS DIRECT READING
ASK FOR BULLETIN 2448D

Illinois Testing Laboratories Inc.
412 N. LA SALLE ST., CHICAGO, ILL.

1,000 Attic Fans Since 1937

(*Continued from page 63*)

fifty-inch Chelsea attic ventilating fans have been sold; 8 of these to be installed in the Personnel building, 8 in the restaurant and 2 in the kitchen.

An unusual installation is that made by the company for the City of Houston, Recreation Department in two park structures. In each of these park buildings, 3 Hunter attic ventilating fans of 20,300 cfm capacity, have been set in a horizontal position, in an especially recessed portion of the ceiling. The blades are decorative and are in plain view. The usual process in this instance is reversed, in that the fans discharge the air

Hunter Attic Fans Backed by 50 Years Experience

With more than 50 years of experience in manufacturing ventilating fans exclusivley, the Hunter Fan and Ventilating company of Fulton, N. Y., has placed on the market one of the nation's outstanding attic fans, J. C. Rose, ventilation and insulation expert of the Air Conditioning company, announced.

"The Hunter attic fan is not just another fan," Mr. Rose said. "The Hunter fan represents many years of research and engineering ability.

"It is a fan that is built to last and give satisfactory service for many years. It is a fan that will deliver huge quantities of air with no noise or vibration.

"The Hunter fan is noiseless because of its precision-built housing, blades and motor," he said.

In addition to purchased advertising space, the company's advertising agency also prepares and submits to local metropolitan and suburban papers, news items like the above. These news items are considered successful in building acceptance of the company and its products.

"Dealer Features 'Tripl-ife' 20-Year Guarantee"

"The Williamson Heater Company:

"The outstanding point that I use in closing my sales, is the exclusive 20-year guarantee made possible only by 'Tripl-ife' iron, an unusually tough, high-heat-resisting metal, developed by Williamson after years of careful research. This one point is such an outstanding owner benefit, that in a majority of cases the prospect cannot fail to recognize at once what this means to him. He will immediately see that he will be assured years of trouble-free comfort and heating satisfaction. He will see that he will have no parts to replace for 20 years."

Signed—XYZ, Kentucky

Complete information; name, address of writer of above letter furnished on request. Phone, wire or write The Williamson Heater Company.

FREE: Complete, easily understood short method for figuring air conditioning job. You can complete your figures, price job in one hour flat. Write Dept. No. 2. The Williamson Heater Company, Cincinnati, Ohio.

Complete Line . . . Quick Service

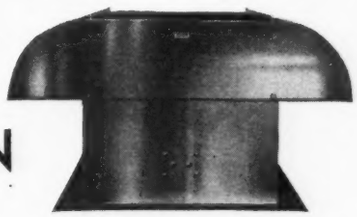
WILLIAMSON
WARM AIR FURNACES

This is our Fifty-first year

ROOF FAN

"Type H"

ALLEN



Here is a "roof fan" ventilator of unique design, for installation on roofs from flat to 45 degree angle. Lower in height than louvre style and lower in cost. Installation extremely simple. Air dampers open and close automatically as fan is turned on or off. Completely rain proof.

Made in the usual high quality of all Allen ventilating equipment. Ask for circular on this new unit.

Also get our complete file of descriptive sheets of the MANY Allen ventilators for wide and varied use. They will help you sell many jobs!

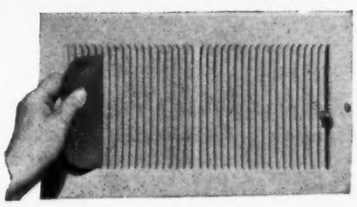
The ALLEN Corporation

Ventilation Specialists

9752 ERWIN AVE., DETROIT, MICHIGAN

STANDARD
REGISTERS, GRILLES
AND
PERFORATED METALS

BEND-EZY REGISTERS and GRILLES



ADJUSTABLE FOUR WAY DIRECTION

The "BEND-EZY" is stamped from sheet metal, and consists of a group or groups of bendable bars which are set at an angle of 30 degrees at the factory and the bars may be set at any desired angle in the field.

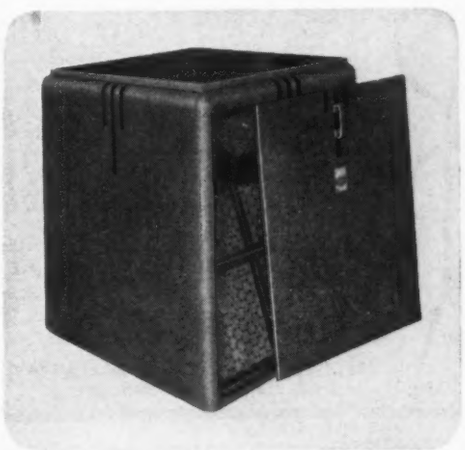
Design No. 31 V-HMS (Sidewall Multiple Valve Register) face consisting of two groups of vertical bars one-half set to the right and one-half to the left, with horizontal "Thin Man Shutters" adjustable to direct the air flow from either straight outward or up or down and to complete shut-off.

The shutter is shallow, depth closed ½" at top and bottom, 1¾" at side of handle. Depth opened 1½" at top and bottom, 2" at side of handle.

Further information on request. Please write today.

STANDARD STAMPING & PERFORATING CO.

3137 W. 49th Pl. Chicago, Ill.



Viking Blower-Filter Unit
Converts any Gravity Furnace Into a Modern Forced Air System

Every owner of a gravity furnace would like a modern forced air unit, but not all need or will buy a new furnace. You can provide them with all the advantages of evenly disrributed, filtered, circulating warm air by installing a Viking Blower-Filter Package on their present furnace.

Write for complete specifications, prices and sales helps.

VIKING AIR CONDITIONING CORP.

5600 Walworth Ave. Cleveland, Ohio

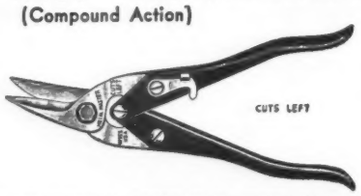
through the doors and windows, and take in air through a grille in the roof.

Due to the fact that a professional advertising agency handles its publicity, the company obtains some worth-while, well-written news stories in the local papers in which its advertising appears. One typical item is shown.

"The growth of our company has been steady and conservative," James A. Walsh, president, says. "We have tried to serve our customers with the finest workmanship and equipment in the country, and by adding the nationally known equipment lines which we are now showing, it gives us an opportunity to be of even greater service to our clients. Our staff of registered engineers is always willing to help in solving questions regarding air conditioning, heating, cooling, insulation and commercal refrigeration. We maintain our own sheet metal department and 24-hour service facilities."

Air Conditioning Company recently moved into new and larger quarters. The company is distributor for General Electric air conditioning, heating, and cooling equipment, and General Electric commercial refrigeration; McCray and Frick products; Deepfreeze storage units; Hunter fans, and Johns-Manville Blown Rock Wool. The new building was built especially for the Air Conditioning Company. Adequate show-room space,

WISS "METAL-MASTER" SNIPS
(Compound Action)



"TWICE THE WORK WITH HALF THE EFFORT"

TWO MATCHED PATTERNS M1 (Cuts Left) M2 (Cuts Right) Cut circles, squares and any irregular patterns on Stainless, Dural and Monel Metals with the greatest of ease. Jaws of wear-resisting Manganese Molybdenum Steel. Handles hot-pressed from tough Chrome Vanadium Steel. Nickel steel bolts and nuts to Government specifications. All parts interchangeable. Detachable rubber handle grips at slight extra cost.

J. WISS & SONS CO.
ESTABLISHED 1848 NEWARK, N. J.

ALMAR EASY SLITTER

This attachment eliminates necessity of an 8' or 10' squaring shear wherever this type of work is limited. Installed on brake in three minutes or can be used on bench. Will cut 28, 26 and 24 ga. metal easily, with neat, accurate edge. Low in price. Fully guaranteed.

Write today for literature and prices!

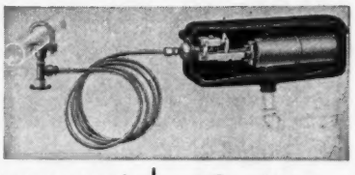
WARD MACHINERY COMPANY
564 W. Washington Blvd. Chicago, Illinois

HAVE YOU MET
THIN MAN
TRADE MARK
THE NEW REGISTER

Designed to meet limited wall thickness requirements—perfect performance assured—always!
Write today for descriptive circular.

REGISTER & GRILLE MFG. COMPANY, INC.
70 BERRY STREET, BROOKLYN, N. Y.

Tomorrow's humidifier valve .... today!



HERE'S the end of your humidifying troubles—a float valve with a new snap action that prevents plugging up or sticking open. Snaps open wide when water drops ¼-inch in pan; snaps to leak-tight closure against any water pressure when water level is restored. Has greater capacity—withstands high temperature—doesn't wire draw or corrode. Write for engineering data proving its superiority.

McDONNELL & MILLER
1318 Wrigley Building, Chicago, Ill.

The New McDONNELL Humidifier Water Control

MEET COMPETITION All the Way with PEERLESS PRODUCTS . . .

Peerless offers the progressive furnace dealer a complete line of entirely automatic, semi-automatic and manually controlled furnaces, winter air conditioners, stokers, oil and gas burners, blowers, and repair parts to meet every sales need. Each Peerless unit sold means the development of new prospects—the foundation of every successful furnace dealership. Write for particulars today!

PEERLESS FOUNDRY CO., 1853 Ludlow Ave., Indianapolis, Ind.

The "QUALITY" *Nail!*

DENISTON
TRIPLE LOCK LEAD SEAL
ROOFING NAILS

Look at it! . . . You can SEE the superiority of this nail! The lead, under the head and down the shank, plugs the hole around the nail with lead to form a weatherproof seal . . . the "bump" triple-locks nail, lead and sheet solidly together . . . when the nail is driven through sheet metal roofing the drive screw shank gives greater holding power than even the Deniston ring shank nail. No loosened roofing, no leakage. Insure QUALITY roofing jobs with Deniston QUALITY Nails. Full details and prices, with samples and demonstrator blocks, FREE.

The DENISTON *Co.*
4856 SO. WESTERN AVE., CHICAGO

warehousing, and space for the complete sheet metal department, which the company maintains, were planned in advance.

Air Conditioning Company was organized five years ago with a staff of five employes. Today the company has a staff of 36. A. J. Mitchell, for the past 10 years associated with the air conditioning industry in Houston, is vice-president of the company. R. W. Kurtz, registered engineer, is chief engineer and secretary; E. B. Cobb, manager of the commercial refrigeration department; and J. C. Rose, manager of architects and contractors division.

♦

Farm Electrification To Continue

Suitable action has been taken by OPACS to enable Rural Electrification Administration to continue its construction program.

Extenson of electrical facilities in rural areas is considered by OPACS to be an essential contribution to public welfare and civilian morale.

REA has proposed to wire over 400,000 farms in the next 18 months at a rate of 22,000 farms a month. Allocation by OPACS will include 4,500 short tons of copper; 3,100 short tons of steel; 140 short tons of zinc; 3½ short tons of aluminum.

RYERSON CERTIFIED STEELS

10 STRATEGICALLY-LOCATED PLANTS

Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes, Mechanical Tubing, Rivets, Bolts, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

MILL EXHAUSTERS

1. Designed and built by the **Pioneer** exhauster manufacturer.
2. Result of over 80 years of air engineering experience.
3. High efficiency assures low power consumption.
4. Sturdy construction assures dependable service.

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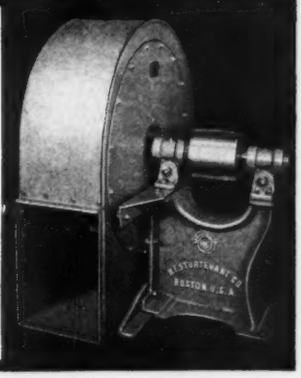
B. F. STURTEVANT CO.
HydePark, Boston, Mass.
Branches in Principal Cities



THE LITTLE BLACKSMITH

3 in 1 Combination Punch, Shear and Bender

Machine No.	CAPACITY		
	Punch	Shear	Bend
0. A.	¼" in 3/16"	3/16" x 1¼"	⅛" x 1¼"
1	5/16" in ¼"	¼" x 2"	¼" x 2"
2	⅜" in ⅜"	⅜" x 3"	⅜" x 3"

Write for catalogue on Punches, Angle Shears, Notchers and Deep Throat Presses.

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Harvest Time Now For You Too...

• *Faster, more profitable, cleanings with the big, powerful Super which handles 111 cubic feet of air per minute at a velocity of over 2 miles per minute.*

• Prevent furnaces, all around you, from starting next winter with handicaps of warped grates, bum smokepipes, cracked firepots. Many need whole new plants. Stokers. Oil burners. Cleaning furnaces is your best bet for getting that business. AND NOW write for our Plan Book and learn how easily competition is doing just that.

THE NATIONAL SUPER SERVICE COMPANY
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CHICAGO STEEL BRAKE

BEST BY FORTY-TWO YEARS TEST

DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. CHICAGO

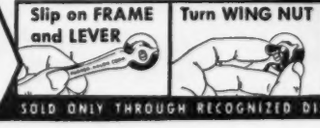
PARKER-KALON Jiffy REGULATOR SET

SIMPLE . . . LOW COST
SAVES TIME
AND LABOR

For controlling dampers in heating, ventilating, air conditioning systems.

PARKER-KALON CORP., 200 VARICK ST. NEW YORK, N. Y.

INSTALLED IN A JIFFY!



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AMERICAN ARTISAN Service Section

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Buy ALLEN *Fluxes and Soders at Your Jobber's*

L. B. ALLEN CO., Inc.
6702 Bryn Mawr Chicago, Ill.

ALLEN "All-Metal" SCRATCH BRUSHES

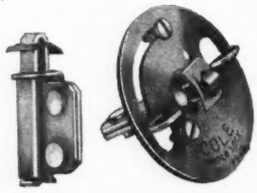
A remarkable brush for speedily removing rust, corrosion, brightening metal. Brush is all metal, hence can be used under torch flame, etc. Brush can be cut off at end, thus renewing life as front end wears down. Bristles of tough, strong steel. Three brushes like illustration. Also one all metal brush, "straight-construction" for battery work, etc. Send for FREE samples.

Send us your jobber's name and we will send you a junior all-metal Scratch Brush.

Buy ALLEN *Fluxes and Soders at Your Jobber's*

L. B. ALLEN CO., Inc.
6702 Bryn Mawr Chicago, Ill.

Cole Damper Lock



★ Winter and Summer setting.
★ For square, round or Splitter damper.
★ No more damper rattles.
★ Fool proof—Low Cost.
★ Write for your free sample.

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HEET-MASTER KETTLES

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Save 50% on Fuel

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STAINLESS-MONEL-COPPER, ETC.

Custom fabrication of all alloys with satisfaction guaranteed. Send blueprints for prices and delivery. Years of experience guarantee responsible and accurate work. TERMS CASH WITH ORDER. Write today for further information.

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SHEET METAL PRODUCTS
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WILLIS • HIPPED • SKYLIGHT and VENTILATOR

Constructed of quality materials to give greatest amount of light and maximum strength of construction. Ventilator is absolutely water tight. Pivoted metal dampers will be included with ventilators, so hung that normally they will be closed. Skylights can be constructed to any size required.

Write for our Skylight Catalog No. 10

WILLIS STEEL CORPORATION
Galesburg, Illinois

The BELLEVUE "One of the Few Famous Hotels in AMERICA"

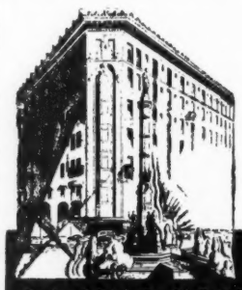
★ . . . became famous through its unsurpassed facilities, its superb food, the unvarying graciousness of its service and its vigilant management. And you will also appreciate its reasonable rates.

★ AIR-CONDITIONED RESTAURANTS

★ **BELLEVUE-STRATFORD**
IN PHILADELPHIA

CLAUDE H. BENNETT
General Manager

Traveling Men Who Cover Buffalo Prefer This Well Located Hotel



Because it is right in the heart of the business and shopping district—because there is always a good room available—because the food is excellent.

RATES

Single ..... $2.50 up
Double ..... 4.00 up

Special rates for 4 or more.

Write for Folder 1-10.

K. A. KELLY MANAGER

Hotel **LAFAYETTE**
BUFFALO, N.Y.

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—What happens between two rooms, one having a six minute air change, and the adjoining room a twelve minute air change?
—Can you install a thermostat control system properly?

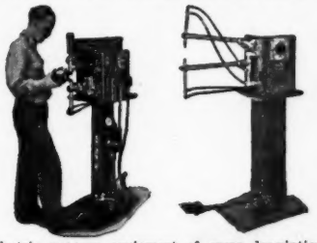
The answers to these and hundreds of other mechanical questions about air conditioning are appearing in the monthly *Air Conditioning Section* of AMERICAN ARTISAN.

If you do not now get the ARTISAN, send us $2 and we will enter your subscription for a full year—12 consecutive issues. Your subscription will yield a rich harvest of money making ideas and solutions to many mechanical problems connected with warm air heating and sheet metal contracting.

AMERICAN ARTISAN
6 North Michigan Ave. Chicago, Ill.

AMERICAN ARTISAN Service Section

WELDING HEADQUARTERS



Electric welding equipment of every description to weld from a watch case to a door. Special or standard SPOT WELDERS from ¼ to 500 K.V.A. A.C. Arc Welders from 100 to 400 Amps. We invite contract Spot Welding in large or small quantities.

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CHAS. EISLER, PRES.
761 S. 13th St. (Near Avon Ave.) Newark, N. J.

The Electric City Gutter Former

MAKE YOUR OWN GUTTER AS YOU WANT IT
Easily and quickly operated. Soon pays for itself

REPLACEMENTS
Beading Rods, Handles, Rolls, etc., quickly furnished.

STERLING BEADER
A simple and inexpensive machine for forming round bead.

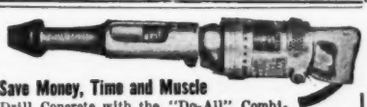
F. L. ROBERTSON
56 RANO STREET BUFFALO, N. Y.

Better for Every Spraying Purpose
MARLEY SPRAY NOZZLES

"Tops" for Air Washing, Humidifying, Brine Spray Lofts, etc. Marley nozzles lead all in sales and in profits to you.

★ Finer, more uniform spray.
★ Effective operation at Low Pressures saves on pumping cost.
★ No internal parts to clog or wear. ★ Longer life, superior materials and workmanship.

MARLEY CO. Write for Literature Now! Kansas City, Kansas



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Trademark
YAGER'S Soldering Salts — Paste
Reg.

Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.
½ lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.
ALEX. R. BENSON CO., INC., HUDSON, N. Y.

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FOR SALE

Closing out at greatly reduced prices. Two Garland One Victor Pipeless Furnace, all Coal, Coke or Wood Burners. About 150 assorted U. S. and Waterloo Baseboard Registers. Also a lot of Cast and Warm Air Dampers. Write for details. Address E. E. Holtkamp, 1011 Francis Avenue, Houston, Texas.

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NEW HANDY MANUAL
on
HEATING, VENTILATING
MECHANICAL REFRIGERATION
and
AIR CONDITIONING

432 pages of practical, condensed information, tables, rules and diagrams. Price $1.00—Remit with order to
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FOR BETTER SAFER SPEEDIER LADDER WORK
KWIK-WAY LADDER BRACKET

Adjustable. Light, Strong, Safe. Attached in 10 seconds. Sheet Metal Workers—here is THE solution to your gutter hanging problems. It offers a practical method of holding ladder from edge of eaves. Indispensable on buildings with wide roof projections. Quickly pays for itself through time saved. Allows one man to handle long lengths with ease and safety. Eliminates carrying various length ladders to the job. Also has many other uses.
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THOROUGHLY REBUILT, for perfect performance. All types; all standard makes. All sizes including the big ones. Hundreds in stock, meeting all requirements. Attractive prices. Fully guaranteed. Expert engineering counsel GENERAL BLOWER CO., Engineers, 403 North Peoria Street, Chicago, Illinois.

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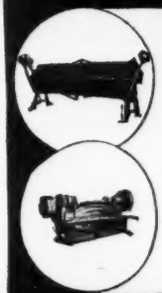

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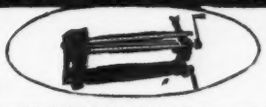
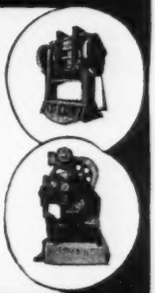


Your Headquarters All Sizes



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MACHINE TOOLS
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PRESSES

QUICK DELIVERY
FOR YOUR IMMEDIATE NEEDS
"SEND FOR OUR LATEST CATALOG"

HELP THE DEFENSE PROGRAM
Release NOW your surplus machinery or trade it in for INTERSTATE'S new or reconditioned machines

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Index to ADVERTISERS

Acme Electric Welder Co. 128
Adams Co., The 102
Aerofin Corp. 23
Aeroil Burner Co., Inc. 134
Air Controls, Inc. ..... *
Air Controls Products, Inc. ..... *
Air-Maze Corp. 112
Airtemp Division, Chrysler Corp. ..... 35 and 36
Airtherm Mfg. Co. 104
Aldrich Co. 130
Allen Co., Inc., L. B. 134
Allen Corp. 131
American Air Fiter Co., Inc. ..... *
American Brass Co. 20
American Nickeloid Co. ..... *
American Radiator & Standard Sanitary Corp. 11
American Rolling Mill Co., The ..... *
Apollo Metal Works 126
Armstrong Co., The 122
Auer Register Co. 3
Automatic Humidifier Co. 106
Automatic Products Co. 105

Barber Gas Burner Co., The 114
Barber-Colman Co. 102
Bard Mfg. Co. 112
Bellevue-Stratford Hotel 134
Benson Co., Inc., Alex R. 135
Berger Bros. Co. 128
Bethlehem Steel Co. 87
Brauer Supply Co., A. G. 126
Bremil Mfg. Co. 128
Breuer Electric Mfg. Co. 130
Buffalo Forge Co. ..... *
Burt Mfg. Co. 125

Carnegie-Illinois Steel Corp. 39
Century Eectric Co. 17
Char-Gale Mfg. Co. ..... *
Cincinnati Sheet Metal & Roofing Co. 120
Clarage Fan Co. 118
Cole-Sullivan Engineering Co. 134
Commercial Shearing & Stamping Co. 123
Conco Corp. ..... *
Condensation Engineering Corp. ..... *
Cook Electric Co. 8
Crescent Tool Co. 97

Delco Products Corp. 34
Deniston Co. 132
Detroit Lubricator Co. ..... *
Doyle Vacuum Cleaner Co. 128
Dreis & Krump Mfg. Co. 133

Econocol Stoker Div., Cotta Transmission Corp. 103
Eisler Engineering Co. 135
Electric Vacuum Cleaner Co., Inc. 110
Elgo Shutter & Mfg. Co. ..... *

Field Control Division 113
Fireline Stove & Furnace Lining Co. 108
Fitzgibbons Boiler Co., Inc. ..... *
Frederick Iron & Steel Co. ..... *
Front Rank Furnace Co. 114

G & O Mfg. Co. ..... *
Gehl Bros. Mfg. Co. 113
General Blower Co. 135
General Controls 119
General Electric Co. ..... *
Gerett Corp., M. A. 117
Gillen Co., J. L. ..... Inside Back Cover
Grant Wilson, Inc. ..... *

Harrington & King Perforating Co. 116
Hart Cooley Mfg. Co. 9
Hart & Crouse Corp. 31
Henry Furnace & Foundry Co., The .. 6 and 7
Heremetal Co., The 124
Hess Warming & Ventilating Co. 124
Hotel Lafayette 134
Hussey & Co., C. G. 28

Illinois Testing Laboratories, Inc. 130
Independent Register Co., The 33
International Heater Co. 109
International Nickel Co., Inc. 5
Interstate Machinery Co. 135

Johnson Co., S. T. 98
Johnson Gas Appliance Co. ..... *

Kidder Mfg. Co., Inc., J. F. 133
Klauer Mfg. Co. 105

Lamneck Products, Inc. ..... Inside Front Cover
Laclede-Christy Clay Products Co. 127
Leader Iron Works, Inc. 101
Libert Machine Co. ..... *
Lincoln Electric Co. ..... *
Lochinvar Corp. ..... 26 and 27
Lockformer Co. 101
Maid-O'Mist, Inc. 130
Maple City Stamping Co. 125
Marley Co., The 135
Marsh Lumber Co., Inc. 121
Marshalltown Mfg. Co. ..... *
Maurey Mfg. Co. ..... *
May-Fiebeger Co. 127
Maze Co., W. H. 127
McDonnell & Miller 132
Mercoid Corp., The 107
Meyer & Bro. Co., F. ..... *
Meyer Furnace Co. 25
Myers Ladder Equipment Co. 135
Minneapolis-Honeywell Regulator Co. ..... 14 and 15
Milcor Steel Co. 72
Monmouth Products Co. 115
Morency-Van Buren Div., Scovill Mfg. Co. ..... *
Morrison Steel Products, Inc. 106
Mueller Furnace Co., L. J. 21

National Industrial Advertisers Association 40
National Super Service Co. 133
Niagara Machine & Tool Works 108
Norge Heating & Conditioning Div., Borg. Warner Corp. 19

Olsen Mfg. Co., C. A. 32
Osborn Co., J. M. & L. A. 10
Owens-Corning Fiberglas Co. 30

Pacific Gas Radiator Co. 38
Parker-Kalon Corp. 133
Payne Furnace & Supply Co. 123
Patten Co., J. V. ..... *
Peerless Foundry Co. 132
Penn Electric Switch Co. 37
Perfex Corp. 54
Philco Radio & Television Corp. ..... *
Premier Division, Electric Vacuum Cleaner Co., Inc. 110
Premier Furnace Co. 126

Quincy Stove Mfg. Co. 121

Randall Graphite Products Corp. 129
Register & Grille Mfg. Co. 132
Reiner & Campbell, Inc. ..... *
Republic Steel Corp. ..... 16 and 42
Research Products Corp. 18
Riester & Thesmacher Co. 134
Robertson, F. L. 135
Rock Island Register Co. ..... *
Round Oak Co. 116
Ruberoid Co., The 118
Rybolt Heater Co. 12
Ryerson & Son, Inc., Joseph T. 133

Sall Mountain Co. 125
Sampsel Time Control, Inc. 117
Schwitzer-Cummins Co. 127
Scott-Newcomb, Inc. ..... *
Scovill Mfg. Co. ..... *
Scully Steel Products Co. ..... *
Skuttle Sales Co. 111
Standard Stamping & Perforating Co. 131
Stanley Electric Tool Div., The Stanley Works ..... *
Sturtevant Co., B. F. 133
Superior Sheet Steel Co. ..... *
Surface Combustion Corp. 29
Swartwout Co. 129
Torrington Mfg. Co. ..... *
Triangle Mfg. Co. ..... *
Tuttle & Bailey, Inc. ..... *

United Service Organizations 41
U. S. Air Conditioning Corp. 100
U. S. Machine Corp. ..... *
U. S. Register Co. 13
U. S. Steel Corp. 39
Utility Fan Corp. 111

Viking Air Conditioning Corp. 131
Viking Mfg. Corp. 125

Wagner Electric Corp. 122
Walker Mfg. & Sales Corp. ..... *
Ward Machinery Co. 132
Waterloo Register Co. ..... *
Weirton Steel Co. 24
Weiss & Co., H. ..... *
Westinghouse Electric & Mfg. Co. ..... *
White Mfg. Co. 120
White-Rodgers Electric Co. ..... Outside Back Cover
Whitney Mfg. Co., W. A. 126
Whitney Metal Tool Co. 115
Williamson Heater Co. 131
Willis Steel Corp. 134
Wilson, Inc., Grant ..... *
Wise Furnace Co. ..... *
Wiss & Sons Co., J. 132
Wodack Electric Tool Corp. 135

Zink Co., John 119

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

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Because GILCO Protects My Profits

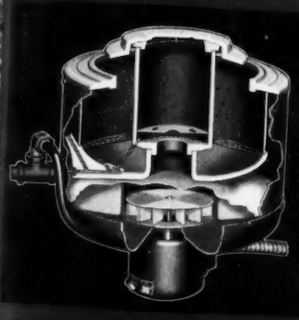
by giving me

PRICE – PERFORMANCE – CONSTRUCTION

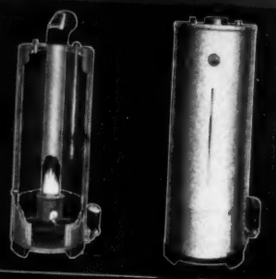
GILCO "C" SERIES WITH VAPORIZING POWER BURNER

GILCO "L" SERIES WITH PRESSURE TYPE BURNER

GILCO VAPORIZING POWER BURNER IN "C" SERIES FURNACES



GILCO AUTOMATIC OIL BURNING WATER HEATERS



● Dealers everywhere are tying up with Gilco because Gilco gives all three; price, performance, and construction.

It takes more than low price to profitably sell the volume market. Care free performance and long life construction are just as important —without them profits are imaginary and customers dissatisfied. You must have all three for real profits and a sound foundation for your business. With Gilco you get all three.

Gilco is a complete line of oil burning furnaces and water heaters priced for the volume market and designed and constructed for complete owner and dealer satisfaction.

★ **The "C" series furnaces with Gilco's vaporizing power burners are already recognized as the best buy in heating equipment. Their performance, efficiency, appearance, and construction are unequaled, yet they are priced with the lowest. The burner is completely assembled and installed in the combustion chamber with all adjustments accurately and properly made at the factory. They are listed as standard by Underwriters Laboratories for No. 3 fuel oil and the entire furnace and burner units are approved under the CS75-39.**

★ **The "L" series furnaces with pressure type burners are the ultimate in design and construction. They are competitively priced and have many outstanding exclusive features. They are sold both with and without burner and controls.**

★ **Gilco's line of automatic oil burning water heaters are famous for their dependable performance and low operating costs. They are fast becoming the most popular unit of their kind on the market. There are four sizes with 20, 30, 40, and 50 gallon storage capacities. All are listed as standard by Underwriters Laboratories for No. 2 fuel oil.**

You will be proud of Gilco equipment—proud of their appearance, efficiency, design and long life construction; and proud that it is possible for you to offer such equipment at prices that compare with the lowest, yet gives so much more.

PRICED TO SELL

All Gilco equipment is priced for the volume market. Designed and constructed for complete dealer and homeowner satisfaction.

All Gilco equipment is Listed as Standard by Underwriters Laboratories.

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Street_____

City_____ State_____

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DOWAGIAC, MICHIGAN

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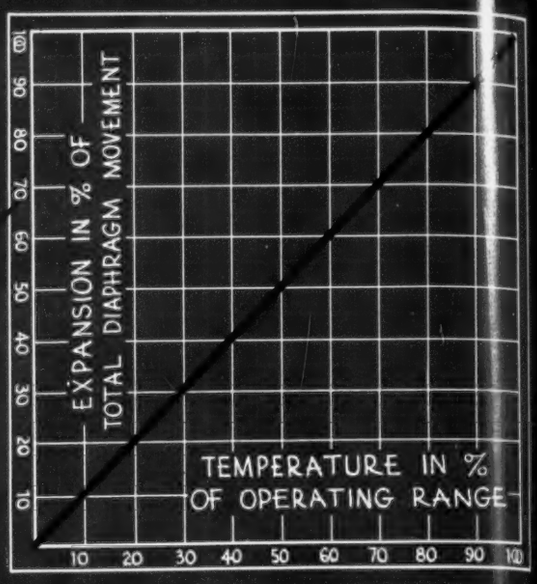

EXPANSION IN % OF TOTAL DIAPHRAGM MOVEMENT
10 20 30 40 50 60 70 80 90 100
TEMPERATURE IN % OF OPERATING RANGE
10 20 30 40 50 60 70 80 90 100

"HYDRAULIC-ACTION" CONTROLS

You sell prospects and satisfy customers in terms of the comfort, convenience and safety delivered by your warm air equipment — and the degree to which you provide these advantages is dependent upon the controls you install.

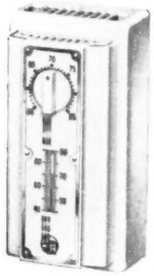
With any type of fuel, Hydraulic-Action Controls will bring out the best possible performance of your equipment by providing accurate temperature and automatic fan control plus positive warm air limit protection — with safety and installation features never before offered to the warm air industry.

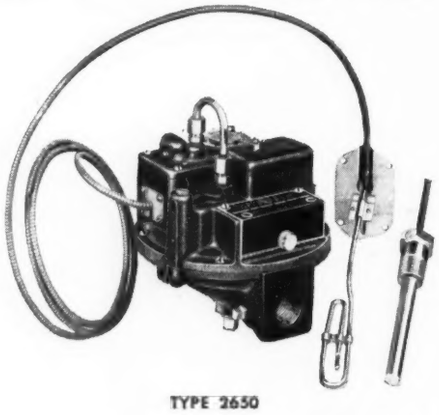
See for yourself how the complete line of White-Rodgers Hydraulic-Action Controls can win more customers and simplify your installation and service problems.

Write today for your copy of the new White-Rodgers Heating Catalog!

TYPE 130

Accurate White-Rodgers Heat Anticipating Thermostat with Touch Temperature Adjustor and recessed thermometer. Attractive finish in ivory with chrome trim.





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Diaphragm Gas Valve and built-in Hydraulic-Action mechanical limit control, combined into one easy-to-install unit. Various types and sizes available for warm air or hot water installations.

TYPE 513

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Single Speed Fan Control. Range 100° to 300° F. Flexible Hydraulic-Action element permits flush mounting on furnace housing. Need not be leveled.

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